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ABSTRACT

One of a series of related inquiries, this study focused on computer aided decision making and record keeping in farm management; and on instructional variables in adult agricultural education which affect the reception of agricultural innovations. Phases 1 and 2 of this project entailed use of farm record data in preparing concise summaries and analyses of a farm business, and creation of a system to reduce the time needed by teachers in preparing records for summary and analysis. In the third phase, a least cost formulation was prepared using a linear programing model to generate economic and other predictions for given lots of feeder beef animals. During a workshop on revision of farm management analysis, vocational agriculture teachers and coordinators outlined changes to be made. Findings of the investigation led to several conclusions: (1) agricultural innovations flow upward as well as downward; (2) similarly, the communication system that affords farmers instructional guidance must operate laterally and from below as well as from the top down; (3) most management decisions rest on some earlier decision and are preparatory to other decisions; (4) deliberate planning is needed to insure the instructional value of decision making in farm business management. (LY)

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FINAL REPORT

Project No. 7-0758
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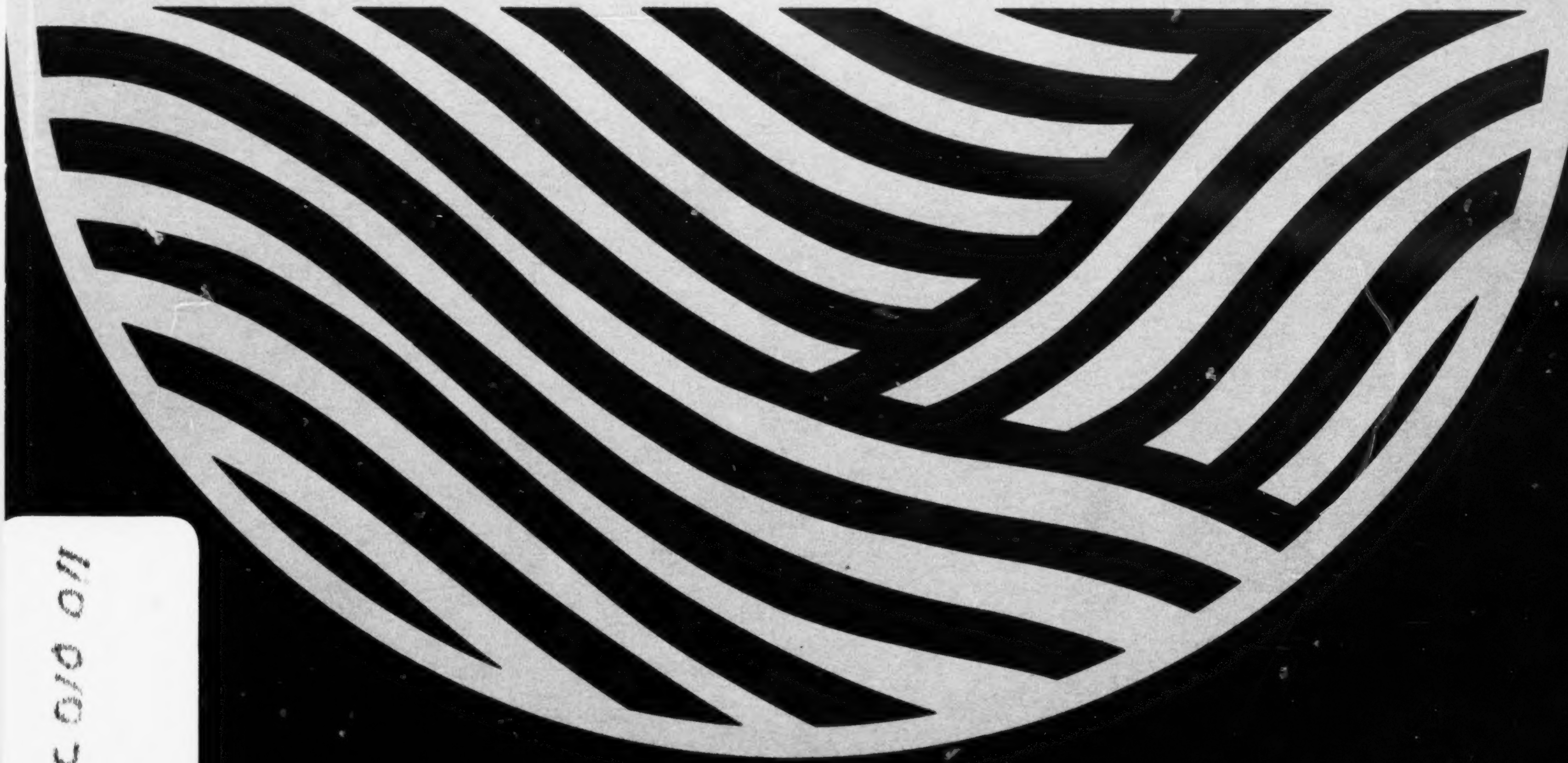
DEVELOPMENT AND DEMONSTRATION OF INNOVATIONS IN ADULT AGRICULTURAL EDUCATION

By Edgar A. Persons, Gary W. Leske, George H. Copa

University of Minnesota, Minneapolis, Minnesota 55455 / December, 1970



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September 1970

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FOREWARD

A study of innovations in adult agricultural education is the substance of this report. It is one of a series of related inquiries undertaken by its authors. As in the related inquiries, this study is focused on the process and techniques of decision-making and on the instructional variables which effect these processes and techniques.

Two kinds of conclusions are drawn from the research. The first are explicit--those which are specifically addressed to the objectives of the study and those which report refinements in the tools and equipment for improved instructional and agricultural management. The second are implicit--those observations which add to the conceptual structure embracing the body of knowledge being expanded by this study and related inquiries. Concepts thus illuminated assist in providing both a theoretical and an operational rationale for subsequent hypothesis and, thus, for further inquiry. What are some of these implicit conclusions?

It seems clear, first of all, that agricultural innovations flow from the bottom up as well as from the top down. Traditionally it has been assumed that agricultural innovations emerge from the laboratory, the test plot, or the experimental farm and subsequently flow down to farmers who accept and adopt them. This and related studies have demonstrated that innovations must be optimized in a goal-oriented "mix" and that the optimizing process is itself an innovation. This optimizing process occurs largely at the farm level, but its value extends upward and outward throughout the system. It is an increasingly valuable innovation as farmers recognize and utilize its instructive potential for improving managerial decisions. The enhancement of this instructive potential is a major accomplishment of this study.

Second, the communication system upon which farmers must rely for instructive guidance must have flow characteristics which move laterally and from the bottom up as well as from the top down. If the system is to move beyond the rudiments of an information flow, the system must depend on the deposits of information made by individual farmers as well as on information withdrawals. This is the basis, in fact, of any management information complex which develops as an agricultural management system. But it is not sufficient to merely store and retrieve information. It must be in containers which are convenient, properly labeled, and designed to insure the utility of the information when retrieved. Most of all, this information or communication system must efficiently accommodate many users and its expanding use should develop its own intrinsic merit as a generator of information. The development of such a multi-faceted management information flow is another major accomplishment of this study.

Finally, it may be concluded that all management decisions are decisions of magnitude. Few are completely independent; most are based on some prior decision and most are preparatory to a subsequent decision. Each may be instructive; but the instructive nature of decision-making is neither automatic or axiomatic. It is necessary to establish a deliberate intent or plan to insure the instructive nature of the decision-making process in farm business management. This is the most transparent implication of this study and its most compelling invitation to further exploration.

Gordon I. Swanson
Co-Investigator

ACKNOWLEDGEMENTS

Some projects draw almost all of the needed inputs and manpower from within their paid staff. This project could not. In fact, without the cooperative effort of the seventy-five farmers and their wives, the twenty-five vocational agriculture teachers and the nine agriculture area coordinators in area vocational technical schools, the project could not have been completed.

If there has been progress in improving the efficiency and management of education programs for adults through the development and demonstration of the innovations reported here, the credit belongs to the on-the-farm and in-the-school researchers who donated time and energy to making a significant contribution. The project staff and principle authors of this report express their sincere thanks.

The tireless effort of the management and staff of Agricultural Records Cooperative are also commended for their efforts. Mss's Hoffman, Koschke, Gjermundson, Oertel, Yost, and Mrs. Scheider have gone the extra mile to accommodate the development and operation of these projects.

The cooperation of other departments on the University of Minnesota campus have not gone unnoticed. Without the competent counsel of Dr. Goodrich and Dr. Meiske of the Department of Animal Science, Compute-Rations-Beef would not have materialized. Nor would the progress have been as meaningful without the guidance of Dr. Hasbargen from Agriculture and Applied Economics.

A major guidance role has been played by Dr. Truman Nodland, Agriculture and Applied Economics. His background in farm business records and his influence on the project staff and the teacher cooperators has been keenly felt.

"Light is the task when many share the load."

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SUMMARY

A need to examine ways of utilizing management decision tools such as computers, promoted the three phase development of this study. There was evidence that improvement was needed in the analytical tools available to educators as they worked in helping farmers to learn how to manage their businesses more effectively. Phase one of Development and Demonstration of Innovations in Adult Agricultural Education was addressed to the task of utilizing farm record data in the preparation of concise summaries and analyses of a farm business.

The record phase of the study had as its purpose, improvement in the efficiency and management of the teaching task. Teachers of adults in management education were limited in the number of persons they could effectively serve by the extremely heavy demands on their time during the months of January, February, and March when farm business records were being drawn to a close and others being newly established. The purpose of phase two was to design a record system to reduce the time required by teachers in preparing records for summary and analysis.

A third phase of the development was the demonstration of computer technology as a mechanism for solving some of the complex problems in choosing alternatives associated with the decision making process. It is recognized that farm operators and managers must make a large number of decisions which require the simultaneous consideration of a number of alternatives. To demonstrate the effectiveness of computer technology as a decision aid, a least cost ration formulation was prepared using a linear programming model to generate ration and economic predictions for given lots of feeder beef animals.

Phase I - Farm Business Analysis.

Using a workshop as the media for revising the farm business analysis, vocational agriculture teachers and coordinators outlined changes to be made. The resulting document provides for the overall summary of the business as well as increased attention to its parts.

Cash incomes and expenses, accrual accounting by enterprise, net worth and capital statements and an overall summary of the business through the use of various management factors describe the farm business as a whole. Enterprise statements for fourteen separate livestock enterprises and twenty-six crops comprise the balance of the report for use in management education programs.

The computer analysis is completely documented with precise instructions for completing each item that appears as part of the business analysis.

Phase II - Experimental Farm Records.

Using a basic mail-in farm accounting system available from Agriculture Records Cooperative, Madison, Wisconsin, an experimental mail-in record program for use in farm management education was developed. Two systems were examined. The first used the regular input mechanism of the electronic farm record program; the second used a bank check voucher to capture farm business data.

The program was developed by using twenty-five cooperator units. Each unit consisted of one farmer on a monthly mail-in program, one farmer using the check voucher system, one farmer acting as a control by continuing to use his account book and, the vocational agriculture instructor responsible for management instruction.

As a result of the developmental work, a system of mail-in farm accounting has been devised which has as its end product, the same year-end business analysis that can be obtained through the use of the farm account book used in the management education programs.

A series of evaluation comparisons were made with the farmer users of the two systems. No data from these comparisons gave any one of the systems a clear-cut advantage over any other. There appeared to be the prospect of considerable time saving during the critical period of the year (January - March) in closing an account for analysis. Since the primary objective was to improve the efficiency and management of the teaching operation, this time saving for teachers and analysis center personnel may be significant in increasing the number of clients with whom an instructor can effectively deal.

The use of a computerized depreciation schedule has already been adopted by many of the agriculture educators in adult management programs. The use of this tool alone is expected to save about one hour of the instructors time during record closeout for each management education student. The time saved can be used to add other farm producers to the management program and thus increase the efficiency with which the teacher can operate.

Phase III - Computer Applications to Decision Making.

Using a problem associated with management decision making in beef cattle production, a computerized least-cost process for formulating rations was developed. This problem was selected because it demanded the simultaneous consideration of a large number of variables and the incorporating of a number of mathematical functions that were essential to the problem solutions, but would probably not be available to the farm operator.

The developmental task proceeded by first examining other programs of a similar nature available throughout the United States. Of the two States with functioning programs (Iowa and Oklahoma) neither was judged suitable for the intended purpose. Through the combined efforts of representatives from the departments of Animal Science, Agriculture and Applied Economics, Agricultural Education, and the St. Paul Campus Computer Center, the guiding principles for the development of such a program were outlined. Following the guidelines for development, the input, linear program and report--writer computer programs were written. The resulting ComputeRations-Beef program was tested in a pilot run by thirty-eight professional agriculturalists in the concentrated beef feeder area of the state.

This report contains the project description, computation system and operational system for ComputeRations-Beef, but has not been adequately tested to recommend its adoption. Supplementary funding has been organized to continue the development of ComputeRations-Beef following termination of this project. Plans have also been made for disseminating the information about the program and organizing a plan to provide such service to educators and producers.

CHAPTER I

INTRODUCTION

Projections of the supply of agricultural manpower extend obvious trends. In 1960, farm managers, laborers and farm workers constituted 6.5 per cent of the total United States population.[1] By 1975, projections indicate only 3.6 per cent of the population will remain in this occupational category. An actual decline in numbers is indicated. In 1958, the Ninth Federal Reserve District included 374,886 farms; however, by 1975, the number projected is about 272,900.[2] Consequently, the average size of farm will increase from 533 to 690 acres. Average annual net income is expected to rise from 4118 dollars to 6011 dollars (1960 dollars).

The changes outlined above are neutral projections not predictions. No assumptions are made about factual conditions, it is simply assumed that the present rates of change will continue. Any significant change in conditions would alter the rate of change and also the predictions. If world demand for United States agricultural products increases or decreases significantly, the future agricultural position would be considerably different from the projections. The rates of change would be modified by new conditions which ultimately would alter the degree and direction of change.

The projected changes in the agricultural sector are logically interpreted as quantitative change. Although it is not as obvious the present rates of change do contain qualitative factors. It is useful to consider four of the qualitative conditions affecting agricultural projections.

First, the absolute number of persons employed on farms will still be the largest single occupational group in the United States, even if the proportion of the population employed on farms drops to 3.6 per cent by 1975. The agricultural category will include 7.7 million persons in the projected population of 215 million.[3] This group will continue to be unique in that all retraining efforts must involve the problems of the self-employed rather than the problems of wage-earners. The agricultural self-employed may be the most neglected occupational group from the standpoint of occupational retraining.

Second, the educational attainment of the farm population remains the lowest of any occupational category. In 1962, the average educational attainment was 8.7 years.[1] By 1975, it will rise slightly but it will still be the lowest of all occupational categories.

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[1] U.S, Bureau of the Census, Census of Population: 1960 (Washington, D.C.: U.S. Government Printing Office, 1962), p. 528.

[2] James M. Henderson and Anne O. Krueger, National Growth and Economic Change in the Upper Midwest, A Publication of the Upper Midwest Economic Study (Minneapolis: University of Minnesota Press, 1965), p. 47.

[3] U.S. Bureau of the Census, Statistical Abstract of the United States: 1968 (Washington, D. C.: U.S. Government Printing Office, 1968), p. 7

Third, the output per worker in agriculture has risen sharply, but this rise is largely fictitious. A migration of the underemployed and the unemployed out of agriculture rather than a pure change in labor productivity has occurred. A decline in national unemployment made this out migration possible. The rate was 5.5 per cent in 1960, 4.5 per cent in 1965 and 3.8 per cent in 1968.[2] With the recent reversal of this trend, migration may cease to contribute to apparent rise in output per worker in agriculture.

The output per worker in agriculture has also been pressed upward by other factors. Capitalization has resulted in an increase in output per machine-man-hour. The interaction of labor and capital cannot be ignored. The capitalization of agricultural support industry and service groups further complicates the evaluation. Capitalization was encouraged by government policy as reflected in accelerated allowable rates of depreciation and the 7 per cent investment tax credit. It remains to be seen what affects the recent repeal of the investment tax credit and reduced depreciation rates will have.

While the increase in productivity due to increased management skill has been considered relatively insignificant, it now appears that this variable has growing potential to increased agricultural productivity. Improved management competence is demanded by present economic conditions and also by the physical reality of increased farm size. To sustain current rates of efficiency and to insure that expenditures for food will not demand a greater proportion of family budgets, management skill of farmers must necessarily increase.

Fourth, national manpower policies recognize the need to retain at least one per cent of the labor force per year; a goal to which they aspire. This goal was set forth in the Manpower Training and Development Act of 1962, assumedly based upon the recognition of obsolescence in the skills and knowledge of all segments of the labor force including agricultural workers.

These four qualitative conditions of the agricultural occupational category suggest that training for agricultural employees will not be less important as the numbers reported decrease but will become increasingly more rewarding to society. What type of training is or should be available to farm managers and operators? The training must be programmatic. It cannot rely on informal contacts or sporadic meetings. It must be orderly and efficient in its organization. In addition, it must involve efficient instructional procedures and it must employ instructional technologies which are as refined as the agricultural technology to which they are applied.

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[1] Henderson and Krueger, p. 55.

[2] U.S. Bureau of the Census, Statistical Abstract of the United States: 1968, p. 217.

Society has not been unaware of the need to assist and train farm managers and operators. In the 1890's, the University of Minnesota personnel began to develop the study of farm management economics while conducting agronomic studies.[1] Cost studies were started in 1902. Within the next few years, these studies were modified to include livestock as well as crops, earnings statements, and assistance in interpretation and planning. In the post war period, the major objective of farm management studies was to provide information for planning efficient farm operations. The analysis of factors affecting farm earnings became an important part of the work. In 1953, the University of Minnesota discontinued its cost accounting routes and began securing data from cooperative farm management services developed out of the earlier work.

Provisions were made for Institutional On-The-Farm Training under Public Law 16 and Public Law 364. This initiated the most far reaching adult education program in agriculture ever conceived. Mass adult education for farming was the task. Educators in agriculture accepted the challenge and generated principles for adult education that were to revolutionize the entire adult education program in agriculture.

Out of these historical roots emerged the concept of the farm management approach to adult education in vocational agriculture. An accurate farm record and business analysis was considered an ideal tool for sound programs of adult instruction. The Agricultural Economics Department of the University of Minnesota had already developed the procedures for an excellent record summary and business analysis that generated considerable information necessary in the decision processes of farm management. It remained only to modify and adopt these decision tools to implement the new programs.

In 1951, the Hill Foundation funded the Minnesota Cooperative Project in Adult Education in Agriculture. The specific purpose was to coordinate the financial and personnel resources of the various agencies working in adult education in agriculture in Minnesota.[2] This project proved the effectiveness of the farm management based program in meeting the educational needs of farm families.

The individual farm records had been analyzed at the University of Minnesota, but by 1952, the number of farmers involved became large enough to initiate decentralized analysis. Program growth eventually led to the organization of seven analysis centers under the direction of agricultural area coordinators located in the area vocational-technical schools. All agriculture departments in the state had access to the services of a center. The program has grown steadily. This growth is reflected in the number of analyzed farm records included in area summary reports. See Table I. The farm management program now enrolls about 40,000 farmers.

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[1] G. A. Pond, S. A. Engene, T. R. Nodland, S. O. Berg, and C. W. Crickman, The First Sixty Years of Farm Management Research in Minnesota, 1902-1962, (Department of Agricultural Economics, Report Number 283; St. Paul: University of Minnesota, 1965), p. 2.

[2] "The Minnesota Cooperative Project in Adult Education in Agriculture," (Mimeographed paper, Department of Agricultural Education; St. Paul; University of Minnesota), p. 1.

TABLE I. THE NUMBER OF FARM RECORDS ANALYZED IN EACH AREA ANALYSIS CENTER 1956-168.[a]

Year	Duluth	TRF	Mankato	Morris (Willmar)	St. Cloud	Austin	Winona	Yearly Total
1956	28	60	76	39	--	39	23	265
1957	82	54	64	25	57	39	36	357
1958	101	52	58	32	50	46	43	382
1959	79	55	77	16	70	50	31	378
1960	21	57	54	38	77	70	27	344
1961	47	54	52	35	80	81	26	375
1962	45	85	64	43	70	102	41	450
1963	70	138	66	54	102	170	60	660
1964	60	151	99	45	137	202	90	784
1965	123	202	122	73	195	223	114	1,052
1966	156	289	197	54	240	230	121	1,287
1967	123	286	319	105	282	247	166	1,528
1968	55	336	414	142	275	284	166	1,672

During this period there has been a parallel growth in research and development activities. A selected list of titles suggests the development pattern and the impact of the program.

1. "Some Farm Business Factors Differentiating Earnings of Farmers in the Minnesota Vocational Agriculture Farm Management Program."
2. "A Program of Instruction for Adult Farmers in Agriculture."
3. "Input-Output Relationships Among Selected Intellectual Investments in Agriculture."
4. "Farm and Home Business Record Analysis by Use of Automatic Data Processing Equipment."
5. "A Course of Study for On-The-Farm Instruction and Farm Business Analysis."
6. "A National Guide for Instruction in Farm Business Management."
7. "An Economic Study of the Investment Effects of Education in Agriculture."

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[a] Compiled from the Annual Reports of the Vocational Agriculture Farm Analysis Centers.

The latter study warrants further consideration. Persons, et al, studied the returns to investments in education accrued as the result of participation in the vocational agriculture farm business management programs.[1] The benefit-cost ratio for individual participants over the projected eight year period was found to be 4.2:1. The benefit-cost ratio reported for societies benefit from the program was about 2:1. Earlier judgements of the merit of the program were supported.

The projections of agricultural manpower and needs indirectly suggest a need for additional or continued training for persons in the agricultural occupation category. Farm management education programs already available have demonstrated their usefulness and efficiency in providing training for the farm family-operator-manager unit. What immediate factors were operating to further delimit the current problem?

Most research and development activity has occurred in recent years. This recent activity is acknowledged but little change was made in the procedures employed in analyzing farm accounts for instructional purposes until 1965 when Persons directed the computer programming of the analysis procedure.[2] While other businesses had computerized their business analysis procedures, the farm analysis procedure used in Minnesota had special complexities. A single-entry account system designed for simplicity in entry was the source of data. The purpose of the record was not only to establish a balance sheet, but also to provide analytical data to improve the decision processes of farm resource allocation. The computerization of the analysis procedure made available the efficiencies of the computer in calculation operations. This was a major contribution because it reduced the work load of instructors and area center staffs during the peak work period of annual analysis. More important, the computerization of the analysis procedure also implied that additional efficiencies would be generated by use of the computer to accumulate various data currently extracted from the account book.

As noted earlier, the average farm operation has used an ever increasing amount of capital. The 1964 agriculture census data for Minnesota show the average value of land and buildings per farm increased 19.8 per cent from 1959 to 1964.[3] In 1959, the average investment per farm in land

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[1] Edgar A. Persons, Gordon I. Swanson, Howard M. Kittleson, and Gary W. Leske, "An Economic Study of the Investment Effects of Education in Agriculture," U.S. Office of Education Project Number 427-65 (St. Paul: University of Minnesota, Department of Agricultural Education, 1968), p. 1.

[2] Edgar A. Persons, "Farm and Home Business Record Analysis by the Use of Automatic Data Processing Equipment." (Unpublished Master's Dissertation, Department of Agricultural Education, University of Minnesota, 1965), p. 3.

[3] U.S. Bureau of Census, Census of Agriculture, 1964, (Washington, D.C.: U.S. Government Printing Office, 1967), I, part 15, p. 224.

and buildings was $32,605. This figure had increased to $39,075 in 1964. The total increase in capital use is only suggested by these figures since machinery and equipment investment and operating capital use have accelerated at an equal or greater rate. The result has been the necessary utilization of more borrowed capital. This has for many farms produced a credit situation which demands close observation. Lending agencies have demanded monthly cash-flow information from their borrowers.

As the vocational agriculture farm business management program gained maturity, total enrollment, teacher load, years of instruction and flexibility in offerings grew in importance. Palan had outlined the basic phases of the farm management program as follows:

(1) Farm Management I - Farm Record Keeping

(2) Farm Management II - Farm Business Analysis

(3) Farm Management III - Farm Business Organization

(4) Farm Management IV - Advanced Farm Management[1]

Farm families who started farm business management instruction typically remained enrolled at least three years and many continue for more years. Farm families who had been enrolled for ten or more years became common. Typical enrollment distribution for well-organized farm business management education programs is presented in Table II.

TABLE II. A TYPICAL ENROLLMENT DISTRIBUTION FOR A WELL-ORGANIZED FARM BUSINESS MANAGEMENT PROGRAM.[a]

Years Enrolled	Number of Families Enrolled
1	10
2	9
3	9
4	7
5	5
6	4
7	4
8	3
Total	51

[a] Persons, Swanson, Kittleson, and Leske, "An economic Study of the Investment Effects of Education in Agriculture," p. 121.

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[1] Ralph Palan, "A Program of Instruction for Adult Farmers in Agriculture," (unpublished Master's dissertation, Department of Agricultural Education, University of Minnesota, 1962), p. 1.

This distribution suggested that about 45 per cent of the enrollment in a typical program might be expected to be advanced farm management families. As the longevity of a program increased, the total enrollment often continued to increase because advanced students did not voluntarily leave the program and new students were being added. Teacher work loads became excessive, particularly during the first three months of the year during which time the farm record summaries and analyses are completed and interpreted.

But, teachers agreed with Pond, et al:

> In order to use most effectively a farm management service (program) a farmer should have continuous records over a period of years...Farming is a highly dynamic business. Continuous records are needed as a guide for adjusting to current changes in prices, production and techniques. Continuity of membership greatly enhances the value of a farm management service (program)--both to members and... agencies cooperating with them.
> ,,,It takes time to learn how to use the records effectively as a basis for current adjustments to an ever changing environment.[1]

The dilemma was apparent. Teacher time was becoming more scarce and student demands for time were increasing.

Another dimension was added to the problem when commercial electronic farm record programs began appearing in rapid succession. It was difficult to operate an aducational program based on a multiplicity of varied analysis output information. The efficient use of class instruction time was becoming more difficult. More important, a proven instructional program with supporting materials, teaching guides, and documented analysis did not exist for the various record keeping services, but was indeed in existence for the farm account book based program. While electronic farm record services reportedly had advantages such as income tax statements, monthly cash flow, and computational efficiencies, it appeared quite illogical to discard the body of knowledge and experience gained with the account book based program. But, many vocational agriculture instructors felt an account book based system lacked the flexibility needed to fit the modern farmer's needs.

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[1] Pond, Engene, Nodland, Berg, and Crickman, p. 31.

CHAPTER II

THE PROBLEM

Because of the changes in agriculture just described a number of problems in the education of adults for production agriculture became evident. The increased capability for record analysis made possible by adaptation of computer technology opened new avenues of inquiry about the farm business. The capability of making more complete use of farm business data in the analysis of the business was of primary concern to teachers in adult education programs. The data was there. It was now a matter of compiling it in some useable format to broaden the basis for farm decision making.

The second major concern was the increased emphasis by farmers and their creditors on the periodic (usually monthly) reporting of the farmers' cash position. The necessity of some record of cash movement within a farm business was prompted in part by the large amounts of capital used in the business. Some interest in a cash flow record was generated by farmers whose increasing awareness of the complexities of their business prompted them to examine the usefulness of this new form of business reporting.

The account book system of recording transactions did not adapt very well to a cash flow report. To adapt one of the available commercial systems of cash flow reporting would have meant the sacrifice of the year-end business analysis in widespread use in management education programs. The problem was to develop or adapt a record keeping system that would provide periodic cash flow and enterprise information and would retain all of the features of the year-end business analysis in use in the vo-ag program. In addition, some attempt needed to be made to evaluate how well the new system or systems served the needs of farmers.

A third problem was related to the first two in that it concerned the utilization of computer hardware for solving some of the everyday problems which farmers face in the management of their business. An important step in the decision process is examining the alternative routes one can take in satisfying a goal. For some complex management decisions, examining the alternatives is not an easy task; there are many factors to consider, the interrelationships are complex or the alternatives too numerous to easily categorize and evaluate.

The task was to develop and demonstrate the use of computer technology in assisting in the decision process. Since problems of animal feeding are common to many farms, this area was selected for development.

An overriding concern was to develop innovative additions to the current farm management education program; additions that would not only improve the information with which teachers worked, but additions that would add to the efficiency with which teachers could manage their time spent in management programs.

SPECIFIC OBJECTIVES OF THE PROJECT

The three general problem areas have been broadly defined - the solution of each making a contribution to the adult education program in agriculture by improving the data with which the instructor can work, reducing the time required for instruction with each student or aiding in the solution of the consideration of decision alternatives.

The specific aim of the project was to:

A. Bring educators, specialists and technicians together to:

   1. examine systems of farm accounting and record summary and analysis available in Minnesota.

   2. compile suggestions for adaptation of systems currently in operation coupled with innovative suggestions for recombination of existing programs, and new theories of record collection and data treatment.

   3. propose a plan for farm accounting and analysis that would allow the orderly development of systems designed to improve farm management education for high school and adult students.

B. Revise the current system of record analysis to accomplish the following purposes:

   1. to utilize the new information available in the revised editions of the Minnesota Farm Account Book, or similar accounting system.

   2. to establish the format for reporting farm record summary data that has most widespread use in farm management instruction programs.

   3. to maintain continuity with the current farm record analysis scheme so that a basis for comparison between fiscal record years would be maintained.

   4. to present an operational program for a basic record analysis that will include:
      a) instruction and forms for collecting all data necessary for the new form of business analysis.
      b) a catalogue of procedure to indicate the mathematical computation for each individual entry in the record analysis; a documentation of the computer program.
      c) design a series of test cases to test the accuracy of each computer program for data analysis.

C. Develop on an experimental basis a system of record keeping that will provide for monthly reporting of cash income and expenditures cumulative receipts and expenses, enterprise information and will culminate in a business analysis identical to that received through an account book record system. The system should test the feasibility of using two or more methods of inputing farm data.

The usefulness of the project will be evaluated on the basis of:

1. assessment of the advantages and disadvantages of the experimental systems as compared to a conventional record book.

2. opinions of users on the merit of various aspects of the experimental systems.

3. errors made in recording information.

4. time spent in keeping records.

5. observations of project personnel regarding the operational procedures of the experimental system.

D. Develop and test one or more of the innovative computer applications to agriculture designed to help examine alternatives for decision making.

CHAPTER III

REVIEW OF LITERATURE

The purpose of this review is to present a selected sample of the literature which the authors feel reflect:

1. The importance of record keeping in a farm business management education program.

2. The research and development effort supporting the Minnesota Vocational Agriculture Farm Management Education Program.

3. The development of electronic farm record systems.

4. The work effort involved in operating a farm management education program.

Importance of Records

The vocational agriculture program in Minnesota has had as one of its philosophical basis what has become known as the farm management approach. Hodgkins defined the farm management approach in operational terms:

> ...The farm management approach means to first find the problems in the business, teach according to those findings, apply what is taught to the problem and evaluate the results.[1]

This is simply a variation of the problem solving approach to learning.

Hodgkins also stated:

> ...The farm management approach and the farm management program are based on farm records...farm records are the core of any program of instruction in farm management.[2]

He felt that logic alone erased the need to question the value of records for farm management analysis purposes. He reasoned that no other way to measure the effectiveness of changes in farm organization and management exists. He defined records as indicators identifying the success or failure of management decisions. He warned that the business analysis was only as accurate as the record, no more accurate. The value of the business analysis was in fact determined by the record.

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[1] Delbert L. Hodgkins, "Techniques and Methods of Instruction in Farm Management" (unpublished Master's dissertation, Department of Agricultural Education, University of Minnesota, 1957), p. 16.

[2] Ibid., p. 14.

Schmidt delimited the value of farm records in farm management using a similar argument.[1] He felt the central purpose of record keeping was to provide the basic information for a farm business analysis which in turn allowed location of strong and weak points in the business. Obtaining this information was the necessary first step toward improving farm management.

The importance of records in the farm business management education program was most relevantly expressed by Granger. He said:

> ...Any program of vocational education for farmers which attempts to improve the management abilities of farm operators must use data from individual farm businesses.[2]

Herbst suggested that records can be useful in improving the farm business, financing it and meeting legal requirements.[3] He emphasized that records as such do not improve a business, but they are a basis for bringing about improvements. He indicated that there are two major ways records can be used to assist in business improvement: (1) as a diagnostic tool - pointing out strengths and weaknesses, and (2) as a source of data - furnishing information for budgeting and planning.[4] He also noted that records help in maintaining financial control and in obtaining credit. Records reveal current financial status and help predict credit needs.

Hopkins and Heady identified what they saw as the objectives for keeping records and accounts:

1. To provide a basis for filing income tax and social security.

2. To provide control over the business.

3. To improve the management of the farm.

4. To fairly meet the arrangements of share leases or partnership agreements.

5. To provide a basis for farm credit and financing.[5]

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[1] John R. Schmidt, "Using Farm Records for Business Analysis," (Department of Agricultural Economics, Agricultural Economics 33: Madison: University of Wisconsin, 1961), p. 3.

[2] Lauren B. Granger, "Some Farm Business Factors Differentiating Earnings of Farmers in the Minnesota Vocational Agriculture Farm Management Program," (unpublished Ph.D. dissertation, University of Minnesota, 1958), p. 4.

[3] J. H. Herbst, Farm Management; Principles, Budgets, Plans (Champaign: Stripes Publishing Co., 1968), p. 207.

[4] Ibid., p. 208.

[5] John A. Hopkins and Earl O. Heady, Farm Records and Accounting (V: Ames: Iowa State University Press, 1964), p. 5.

Research and Development

The Hill Foundation grant for the Minnesota Cooperative Project in Adult Education in Agriculture spurred the advancement of study in the area of the farm management approach to adult education.

Program of Instruction. The content of an instructional program in adult agricultural education farm business management was most adequately outlined by Palan. The philosophy and logic he presented has become synonymous with the adult farm management program. Before outlining the instructional sequence, Palan discussed the elements of adult education for farmers.[1] He felt a program of instruction should include three specific phases: (1) the farm management phase, (2) the mechanized agriculture phase, and (3) the enterprise phase. He stated:

> The farm management phase must be the foundation for the entire course of study. It will begin with individual farm families enrolled in specific courses composed of definite units in an organized sequence. This study of farm management should be set up to include a period of three or more years to permit families to keep pace with the instruction in carrying out programs to reach their objectives. The farm management phase can be subdivided into nine areas of consideration which must be approached in a definite chronological order. These can be stated briefly as follows:
>
> 1. Analyze the present situation.
> 2. Locate the problems.
> 3. Set up objectives or goals.
> 4. Size up the resources.
> 5. Look for various alternatives.
> 6. Consider probable consequences and outcomes.
> 7. Evaluate the expected results.
> 8. Decide the course of action.
> 9. Put the plan into effect.
>
> ...The farm management phase must have as its beginning, an accurate and realistic source of information which will be used to locate the problems, set up objectives and evaluate the resources. There is only one natural place to go for such source of material and this is a record of the farm and home business...Therefore, the first year of the farm management phase will be spent entirely on motivation for, and the keeping of, these accounts. The necessary individualization in the program for the first year can be developed through farm and home visits...
>
> ...Organized classroom material during this second year will deal with general interpretation of a farm business

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[1] Ralph L. Palan, "A Program of Instruction for Adult Farmers in Agriculture (unpublished Master's dissertation, Department of Agricultural Education, University of Minnesota, 1960), p. 5.

> analysis. Farm families can then recognize general signs of weaknesses and strengths throughout their own farm business. This class material will also furnish background information which will be very useful when the vocational agriculture instructor helps the family with more specific individual interpretations on farm and home visits.
>
> The third year of the farm management phase will be a continuation of the second in that another year's farm business analysis is available for study. Class work will emphasize enterprise efficiencies and deficiencies to a greater degree, since trends will begin to be significant. Major emphasis during the third year can be pointed toward A beginning study of farm business reorganization. Methods for developing reorganization plans can well be illustrated through the use of example farms...[1]

Palan outlined a program of instruction for the first three years of a student's enrollment. The yearly course titles and the lesson topics indicate the proposed pattern of instruction.

Farm Management I - Farm Records and Accounts

- Stimulating An Interest in Farm Records
- Showing The Need for Farm Records
- Measures of Farm Family Progress
- Uses for Farm Records
- Importance of Inventories
- Feed Records
- The Cropping Plan
- The Mid-Year Feed Check
- Checking Livestock Entries
- Crop Yield Records
- Income Tax Management
- End of Year Inventories
- Crop and Feed Check
- Closing the Account Book for Analysis

Farm Management II - Farm Business Analysis

- Income Tax and Social Security
- Measures of Farm Profits

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[1] Ibid., p. 6.

Measures of Farm Business Size
General Interpretation of Analysis
Inventory Analysis
Crop Selection and Crop Yields
Analyzing Size of Business
Analyzing Livestock Efficiencies
Analyzing Other Costs and Labor
Income Tax Management
Closing the Accounts for Analysis

Farm Management III - Farm Business Reorganization

Attributes of Good and Bad Farmers
What is the Optimum Production Level?
What Do Two Years of Records Mean?
Analyzing the Cropping Program
Analyzing the Livestock Program
Analyzing the Building Program
Analyzing the Family Labor Supply
Studying Income Possibilities
Alternative Crop and Livestock Plans
Building and Equipment Needs
Farmstead Arrangements
Planning Transitional Stages[1]

For each topic plan, Palan described objectives, subject content, teaching activities and experiences and references. In conclusion, he stated, "This is intended to be a year around continuing program with more emphasis on 'what to do' and 'why' than 'how to do it'."[2]

In 1969, Palan and Persons authored a revised edition of Palan's original work.[3] They incorporated additional teaching materials, up-dated materials and references and suggested additional class and on-farm instructional procedures.

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[1] Ibid., p. 19.

[2] Ibid., p. 159.

[3] Ralph L. Palan and Edgar A. Persons, A Course of Study for Adult Farmer Instruction in Farm Management and Farm Business Analysis. (II: St. Paul: Agricultural Education Department, University of Minnesota, 1969), p. 1.

The basic program of instruction which had evolved in Minnesota was adapted for national use in agricultural education programs and short term manpower training programs by Milo J. Peterson and Clarence J. Hemming.[1] First, they identified:

1. Objectives for the course.
2. An organizational plan.
3. The importance of classroom instruction, individual on-farm instruction, and related activities.
4. The need for farm records and record analysis.
5. Guides for determining class size.
6. Methods for securing enrollment.
7. The conditions necessary for a successful program.
8. Teacher qualifications.[2]

Then, they presented the course content with an outline for each of the proposed topics. The unit outline included unit objectives, organizational outline, teaching suggestions, supplemental information and references.

Peterson stated that in all vocational agriculture programs, high school or adult, one essential ingredient is present--"well planned individual on-the-job instruction and counseling."[3] This phase of the adult farm business management program has been developed by most agriculture instructors on an individual basis. Francis developed the most complete guide to on-the-farm instruction based on the philosophy that "A regularly scheduled consultation visit, with a planned purpose, to each member family is necessary to insure continuity and maximum accomplishment."[4] He identified a number of factors relevant to on-farm instruction:

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[1] U.S. Department of Health, Education, and Welfare; Office of Education, Farm Business Management: An Instructor's Guide, Milo J. Peterson and Clarence J. Hemming pursuant to a contract with the U.S.O.E. (Minneapolis: University of Minnesota, 1967), p. 1.

[2] Ibid., p. 3.

[3] Eugene V. Francis, "A Guide to On-Farm Instruction in Farm Management and Farm Business Analysis," (unpublished Master's dissertation, Department of Agricultural Education, University of Minnesota), p. i (forward).

[4] Ibid., p. 1.

1. Each instructional visit will require two to three hours.
2. Interpretation of record based facts is a primary goal.
3. The instructor must teach to develop in his students an attitude of awareness for new ideas and concepts in farming.
4. The instructor must teach to develop the ability of the farm family to view their business as a whole.
5. The on-farm instructional phase of a farm management program must be extremely flexible.
6. Farm visits should be scheduled ahead - use a calendarized schedule.[1]

Francis specifically noted that the individual farm family would have unique problems at a particular point in time. However, he added that most families would encounter the same general problems eventually. Granting the need for flexibility, he presented topics for on-the-farm instruction:

Farm Management I

Contacting the Farm Family

What is a Farm and Home Analysis Program?

Farm Records - Fertility Programs

Beginning Inventories

Crop Plans - Accounting Entires - Depreciation

Feed Record - Projecting Livestock Returns

Feed Check - Observing Crops

Crop Data - Soil Sampling - Livestock Outlook

Livestock Rations

Income Tax Management

Farm Management II

Closing the Account Book - Income Tax

Operating Budget - Weed and Insect Control Programs

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[1] Ibid., p. 5.

Interpreting a Farm Analysis Report

Crop Costs and Returns - Experimental Trials

Evaluating Livestock and Crops

Analyzing Costs and Budget Progress

Income Tax Management - Livestock Management

Closing the Account Book - Tax Management

Farm Management III

New Worth - Credit Planning - Budgeting

Crop Rotations - Conservation Measures

Evaluating the Farm Business

Study Trends

Analyzing Feed Values - New Crop Practices

Planning Livestock Improvement

Closing Farm Records

Advanced Farm Management

Planning Investments in Facilities and Equipment

Planning Investments in Land

Developing Alternative Plans[1]

Each topic included objectives; subject content; teaching activities and experiences; and references.

The studies reviewed above present the skeletal outline for a typical farm management educational program.

Processing and Using Records. Staff members of the University of Minnesota had done considerable research and development work in farm management prior to the 1950's when the vocational agriculture education farm business management program began its development. An account book and a most complete business analysis procedure had been developed. Prior to 1954, all farm business records of participants in the vocational agriculture program were analyzed through the Agricultural Economics Department of the University of Minnesota. This department also analyzed approximately 350 records annually for the members of the Southeast and Southwest Farm Management Services.[1]

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[1] Ibid., p. 16.

Smith reported his observations in establishing and operating a record analysis center in West Central Minnesota.[2] He made relevant suggestions concerning: (1) the role of the agriculture instructor, (2) procedures for closing the Minnesota Farm Account Book and (3) procedures for organizing a record analysis center. He also illustrated the analysis procedure.

Smith emphasized that complete, accurate records are a primary concern to the instructor because the condition of the farm record determines the accuracy and validity of the business analysis and the dollar cost of the analysis.[3] To insure better records, he suggested that normal on-the-farm instruction should stress the following activities:

January
1. Close previous year's record
2. Aid in transfer of inventory to new record book

May
1. Record Crop Data
    a. Acreages of each crop
    b. Amount of seed used
    c. Special treatments, if any

July
1. Middle of Year Crop and Feed Check
    a. Measure bins
    b. Check pasture records

November
1. Crop Yields
    a. Measure cribs, bin or silo[4]

Vocational agriculture teachers have received basic information in farm management and farm record keeping in their undergraduate training. But Aune was among the first to recognize that:

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[1] Ralph E. Smith, "The West Central School and Station as A Regional Center for Analysis of Farm Records in the West Central Areas" (unpublished Master's dissertation, Department of Agricultural Education, University of Minnesota, 1955), p. 1.

[2] Ibid., p. 1.

[3] Ibid., p. 5.

[4] Ibid., p. 8.

> ...To make this information a vital part of their adult classes, teachers need material on organizing an adult class in farm management, ideas on farm management data which can be assembled throughout the year, teaching aids using this farm management data to make the instruction more effective and, above all, ideas for current use of the records by the farmer.[1]

Aune first presented a plan for organizing and conducting an adult class farm management.[2] He then discussed the role of the regional service center at the West Central School and Station in organizing and conducting an adult class in farm management by local high schools. He enumerated the responsibilities of the regional service center or its director as follows:

1. Provide the initial emphasis, encouragement, and leadership for organizing adult classes in farm management.
2. Supply teaching aids and materials for use in the recruiting program and organizational meetings.
3. Meet with adult classes to discuss the proposed program.
4. Tabulate averages at time of enrollment for crop yields, high return crops, productive livestock units per 100 acres, work units per worker.
5. Supply worksheets and forms for recording data.
6. Determine average prices of crops in the area to use in completing crop and feed checks.
7. Supply timely farm management information through a newsletter.
8. Coordinate research and demonstration projects run by local schools.
9. Interpret completed analysis information at local meetings.
10. Assist local instructors through regular visitation.
11. Coordinate area wide farm management tours.
12. Make available supplies such as account books.

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[1] Henrik J. Aune, "Using the Minnesota Farm Account Book and Other Farm Management Material in Teaching Adult Farmers in the Morris Area." (unpublished Master's dissertation, Department of Agricultural Education, University of Minnesota, 1953), p. 2.

[2] Ibid., p. 11.

13. Assemble, tabulate, and distribute current efficiency factors based on area records.

14. Provide instruction on performing the different farm management calculations.

15. Prepare materials on ways to improve standings in various management factors.

16. Tabulate capital invested and net worth to get information on the financial requirements of farming in the area.

17. Prepare a recommended list of references.[1]

These responsibilities have been shifted to agricultural area coordinator's stationed at seven area vocational technical schools.

Aune indicated that the first source of information on the individual cooperator's farm was the information available in his Minnesota Farm Account Book.[2] He emphasized that many calculations are possible during the first record year, granting estimation would be involved in some cases. He explained the calculation procedures for and discussed the use and importance of the following factors: farm management factor estimates, summary of opening inventories, net worth, power and machine investments per crop acre, amount of livestock, numbers of livestock, production records, price received per unit sold, feed costs, farm produce used in the home, cropping program, farm may, crop data page, farm buildings, hired labor, unpaid family labor, custom work rates and household and personal expenses.[3]

Aune continued by identifying the key parts of the annual summaries of the analysis of farm businesses. He discussed the use of the following: the summaries of inventories, the summary of earnings, averages of family living from the farm, averages of household and personal expenses, average of management factors for high and low earnings farms, crop classification, average crop yields, average power and machinery costs per crop acre, and the various individual enterprise summaries.[4] He also reviewed various techniques for presenting the available data such as comparative thermometer charts and worksheets.

Hodgkins described the mechancis of the analysis procedure used at the area analysis center by presenting a descriptive dialogue of the process plus the various forms complete with data.[5] He also presented a very useful discussion on the interpretation of the analysis. He cautioned that to draw anything but very general conclusions from the seven management factors--crop yields, choice of crops, return from productive livestock, amount of livestock, size of business, work units per worker, and control over expenses--without making a thorough study of the analysis was dangerous. Hodgkins felt that the greatest value in comparing the farmer's analysis report to averages was to stimulate further study. He emphasized that averages are not standards in the strict sense of the word. He reported the most useful type of comparison that can be made using the analysis information is to compare the performance of a farm to its past performance.

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[1] Ibid., p. 15.

[2] Ibid., p. 18.

[3] Ibid., p. 19.

[4] Ibid., p. 31.

[5] Hodgkins, "Techniques and Methods of Instruction in Farm Management," p. 40.

Painter wrote two booklets which instructors have found very helpful. One was designed to assist individuals in keeping accurate records.[1] The other was aimed at assisting instructors in interpreting analysis information.[2]

Persons accomplished a major breakthrough in the processing of the farm business analysis.[3] He directed the development of reporting forms and computer programs for the electronic data processing of the calculation phases of the farm business analysis. To clarify the scope of his problem, Persons reviewed and defined the process normally followed in the summary and analysis of a farm business record:

1. Farm business records of cooperating farmers are closed at the end of the calendar year. The local vocational agriculture instructor assists his cooperators in closing their accounts in preparation for summarization and helps them complete their supplementary forms used in summary analysis. These forms are:
    a. Supplementary information sheet...contains personal information on the family and...use made of family and non-family labor...
    b. Livestock report...provides a simple system of checks and balances to insure the accuracy of livestock number accounting...
    c. Crop and Feed Check...provides a means of summarizing the acquisition and disappearance...of all feed and crops over which the farmer had control...

2. Upon completion of the supplementary sheets above and the complete closing of the account, the account is sent to area vocational technical school serving the local Vo-Ag department. The analysis procedure is supervised by the agriculture area vocational school.

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[1] Charles M. Painter, Keeping Records for Farm Analysis; (Austin: Area Vocational Technical School, 1964), p. 1.

[2] Charles M. Painter, Using Farm Analysis Information; (Austin: Area Vocational Technical School, 1966), p. 1.

[3] Persons, p. 1.

3. The area coordinator examines each account...for entry completeness and accuracy. Account column totals are verified to eliminate mathematical errors in the record.

4. The coordinator allocates certain undesignated income and expense items to their respective input-output categories.

5. Standardized prices for home grown feed are affixed to home grown feed fed to each class of livestock.

6. All information pertinent to the analysis of the record is transcribed onto a series of record analysis worksheets in preparation for summarization.

7. Each record is carefully summarized by the use of desk calculators and the results of the calculations carefully recorded on the analysis worksheets.

8. When all accounts have been individually analyzed, they are combined into three groups: a mathematical average for all records in the summary; for a group of records showing high efficiency or earnings; and for a group showing low efficiency or earnings.

9. Summary booklets are prepared showing the averages for the three groups indicated above, with a space provided in which the information from an individual farm can be included.

10. The record summary for each individual cooperator is copied into his account booklet.

11. The cooperator's account book, along with his record summary is returned to the Vocational Agriculture Department from which it originated.

12. The vocational agriculture instructor returns the analysis and farm record book to the farmer cooperator and assists him in interpreting the record summary and analysis for application to his farm business.[1]

Persons was concerned with using electronic data processing equipment in completing steps seven through ten of the above procedure.

As a first step, he designed new report forms.[2] These forms were designed to allow direct transcription of figures appearing in the account book in the order of their appearance. These computer data sheets did not require duplication of entries and handled accounts for partnerships or share rental operators. A short but detailed instruction sheet was written to accompany the forms.

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[1] Ibid., p. 3.

[2] Ibid., p. 14.

Sixty farm records from the 1963 accounts of farmers who had analyzed records constituted Persons' sample for electronic analysis.[1] The results of the computer analyses were compared with the original analyses on file at the analysis centers. Where discrepancies were found, errors were isolated and computer program corrections were made if necessary. In addition, special sorts were made to demonstrate the usefulness of electronic equipment--by farm size in tillable acres, by livestock enterprise or combination of, and by geographic area.

He also developed two alternative administrative procedures for the summary and analysis of records by automatic data processing again with reference to steps seven through ten of the above procedure.[2] Alternative two, for the most part, has been adopted by six of the seven analysis centers. It called for one area vocational school to serve as the administrative headquarters for the electronic data processing program. This center would be the contracting agent with the computer center handling all financial transactions. Each analysis center would be responsible for sending the computer data sheets to the computer center and would receive the completed analysis summaries. The analysis center would retain the editorial functions involved in reviewing and transferring summary input and checking summary and individual analyses. The Area Coordinator Committee (directors of the area analysis centers) would select the administrative center, one of the analysis centers; establish overhead fees; establish accounting procedures; prepare the time schedule for submitting computer data sheets; and determine changes to be made in the next year's analysis.

Value of the Program. Two important studies of the economics value of the Minnesota Vocational Agriculture Farm Business Management Program have been conducted.

Cvancara studied the degree to which production units in agriculture responded to the educational inputs of farm management programs.[3] Two groups of Minnesota farmers were studied. Group A was made up of farmers enrolled in a farm management analysis program during 1960, 1961, and 1962. Group B was composed of farmers who had received farm management instruction during 1962. A farm in group A was paired with a farm in group B on the basis of information for 1962. Pairs were determined using farm size as measured in work units; the combination of livestock and crop enterprises; and soil, climate and topographical factors. Thirty-three farm pairs were obtained. Data for the years 1960 and 1961 for group B were obtained by personal interview while data was available on farm business analysis records for group A. Using the analysis of variance procedure to test the homogeneity of the means of the two groups on selected variables, Cvancara rejected the hypothesis of equal means for the following:

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[1] Ibid., p. 10.

[2] Ibid., p. 17.

[3] Joseph G. Cvancara, "Input-Output Relationships Among Selected Intellectual Investments in Agriculture." (unpublished Ph.D. dissertation, University of Minnesota, 1964), p. 6

1. There is no difference in farm sales between groups A and B for the years 1960, 1961, and 1962.

2. There is no difference between group A and group B for the years 1960, 1961, and 1962 when the criterion measure is difference between farm sales and farm operator expenses.[1]

Cvancara stated:

> ...GroupA...had greater farm sales during this period and comparable farm expenses in 1960 and 1961, than group B. This may be interpreted as follows: instruction in farm management is responsible for greater efficiency and better management by farmers in group A.[2]

He also examined the output relationships.[3] First, the input costs for farm management instruction in the various school districts were calculated. The sum of the quantities per cent of time spent on the farm management phase of adult instruction times cost of instructors (per day), travel costs, and other direct costs divided by farm unit enrollment equal farm unit cost for instruction. The average input costs per farm unit for the 33 pair farms were calculated as $115 for group A in 1960, $102 for group A in 1961, $90 for group A in 1962, and $96 for group B in 1962. Then, the output values of farm management instruction were evaluated by comparing yearly increases in income for group A versus group B. Group A had an increase in cash income of $1,179 per farm unit (1960 versus 1961) and group B had an increase of $403 per farm unit, a difference of $776 in cash income per farm unit favoring group A. For 1961, group B showed an increase of $1,629 per farm unit. This led Cvancara to conclude that group B farms had the potential of increasing farm income and that improvement in farm income was subject to the diminishing returns effect from year to year. The greatest increase occurred during the second year in this study with a continuous though somewhat smaller average increase occurring in the third year.

He also subtracted input costs from the average per farm unit dollar increase between 1960 and 1961. Group A farmers increased their income $558 over group B farmers ($776-$218). An extrapolation was made based upon 50 farm units. The result was a suggested increase in cash income of $27,944 as a result of farm management instruction by one full-time vocational agriculture instructor.[1]

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[1] Ibid., p. 42.

[2] Ibid., p. 59

[3] Ibid., p. 61

While Cvancara's study was subject to limitations in accounting for program costs and in identifying meaningful income measures, it showed a positive response to educational investment and proved a measure of the magnitude of returns that may be expected from participation in the farm business management education program.

Persons, et al, conducted a micro-economic study of the returns to farm business management education based upon the records of 3518 farmers enrolled between 1959 and 1965.[2] The effects of price variations over the seven years were controlled by use of an indexing technique. The average financial success of farm operators whose records were analyzed for the first time in a particular year was given the index value of 100. Within the same record year, the average success of farmers who were analyzing data for the second, third or following times were assigned an index value relative to the performance of the first year people. Curvilinear, or polynomial, regression was used to study the changes in total farm sales, return to capital and family labor, and labor earnings.[3] The independent variable was the years of farm management instruction as measured by the number of farm business records analyzed.

While analysis procedures were applied to all records, Persons, et al, attempted to control for variation in educational input by selecting "well-organized" programs for use in developing prediction data for evaluating the farm management program. Two criteria were used: classes were taught by full-time adult program instructors and the program was judged excellent by a panel of experts.

For purposes of illustrating the value of the program, only the information for labor/earnings will be reviewed here.[4] Labor earnings is a residual measure of the return to operator's labor after allowances have been made for the use of family labor and farm capital. The relationship between mean labor earnings and participation in well-organized farm business management education programs was illustrated. See Figure 1. The mean value for the first year was $3,000. The value increased to nearly $4,000 in the second year and over $4,000 by the third year. The values declined to about $3,200 in the sixth year and then increased at an accelerating rate. The mean labor earnings for the tenth year was about $10,500. About half the variance in labor earnings was accounted for by the number of years enrolled - R^2 of .510. The fluctuation in the curve based on calculated index values was more pronounced than for the mean labor earnings in dollars. It was hypothesized that the diminishing marginal return effect exhibited in the third through sixth years was the natural result of learning initiated from business reorganization with its temporary disruption of income.

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[1] Ibid., p. 79.

[2] Persons, Swanson, Kittleson, and Leske, p. 46.

[3] Ibid., p. 76.

[4] Ibid., p. 76.

The various polynominal equations for estimating income from educational inputs were utilized in benefit-cost ratio determinations.[1] The first eight years of the equation were used. To convert the indexed values to dollars, the weighted average labor earnings ($3,000) of farmers who had their first record analyzed was multiplied by the index value. The power of this procedure was increased by not considering the benefits realized during the first enrollment year as being the result of farm management learnings. The marginal returns for successive years were calculated as the difference between the first and each successive year. Income tax adjustments were made using the accrual method. Discounting the tax adjusted marginal returns indicated the present value of benefits for eight years of enrollment was $3,562 for the average family.[2] Two types of costs were identified: opportunity costs and direct costs. The opportunity cost was the approximate value of the farm operator's labor if he were doing active work rather than participating in the education program. Direct costs were items such as record analysis fee, transportation and supplies. The total estimated costs incurred by a farm family were discounted using the same interest rate (7.0 per cent) and procedure as for benefits--the present value of the cost for participating for eight years was $849.[3] Since the benefit-cost ratio is the present value of future benefits divided by the present value of future costs, the benefit-cost ratio was 4.20 ($3562 ÷ $849). In other words, for each dollar invested by an average farmer in the farm business management education program, the return expected was $4.20. It was obvious that an individual farmer would expect to receive adequate compensation for his efforts.

To estimate the benefit-cost ratio for the community, or society, required a more complex model. The normal tenure distribution of these members had to be considered. Benefits were based upon before tax margins. The benefits for a single year were subjected to the discounting procedure to determine the present value of all benefits over an eight-year period. The present value was $247,411.[4] Opportunity costs for the individuals were the same as reported for individual benefit-cost analysis. Total discounted opportunity costs were $25,202. Direct program costs were the same as the aggregate cost for all individuals. The direct costs had a present value of $18,422. Society costs for program operation were

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[1] Ibid., p. 114.

[2] Ibid., p. 117.

[3] Ibid., p. 118.

[4] Ibid., p. 118.

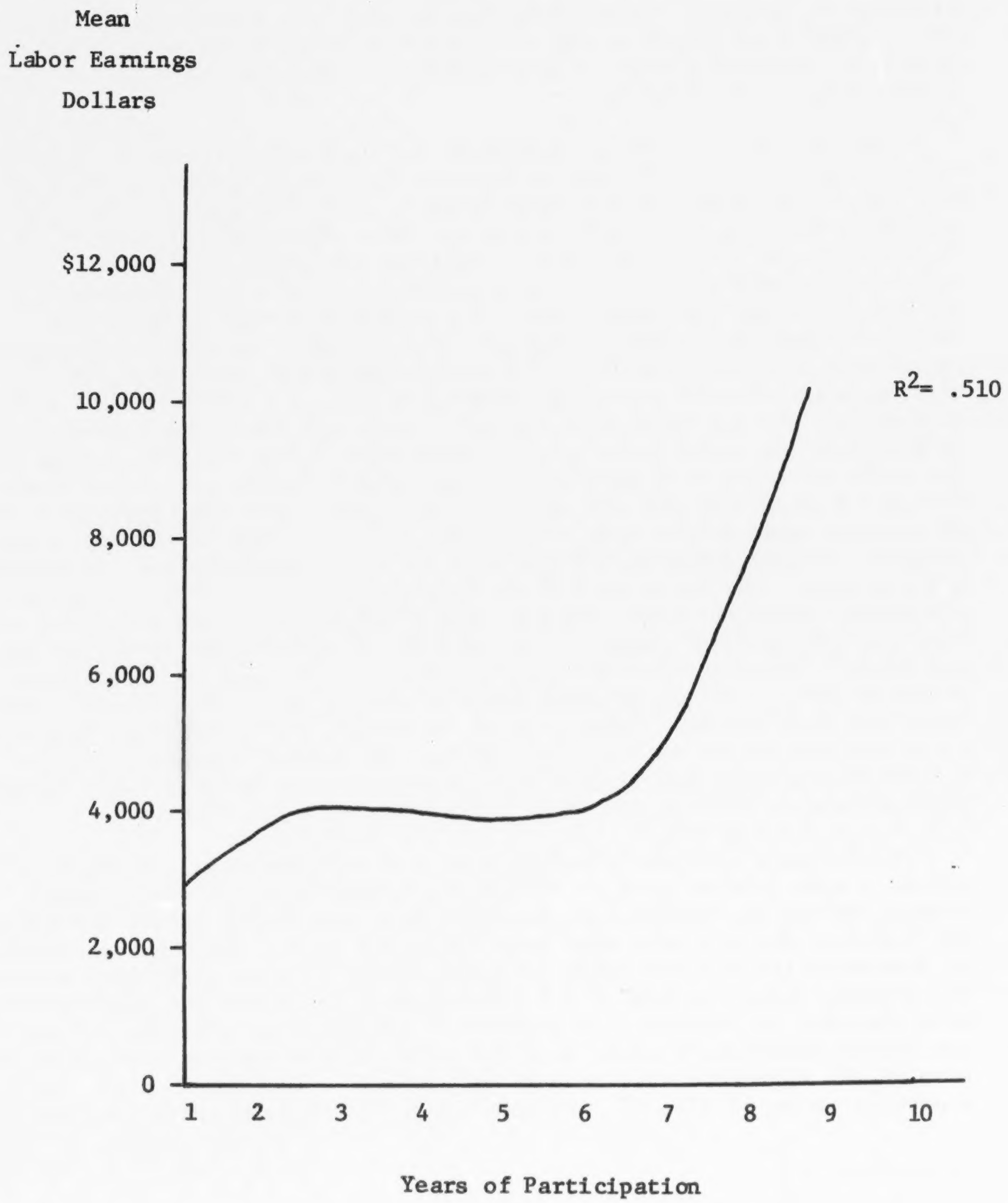

FIGURE 1. THE RELATIONSHIP BETWEEN LABOR EARNINGS AND PARTICIPATION IN WELL-ORGANIZED FARM BUSINESS MANAGEMENT EDUCATION PROGRAMS.[a]

[a] Persons, Swanson, Kittleson and Leske, p. 103.

based upon data obtained from the Agricultural Education Section of the Vocational Division, Minnesota State Department of Education and the estimates of experts. Annual program costs for the community were estimated at $11,537. Capital expenses were based on price quotations of school contracting and supply businesses submitted to the Minnesota Department of Education during 1966. These costs of $8,866 were ammortized over a 20 year period for a yearly cost of $711. The benefit-cost ratio for society was 1.997 ($247,411 + $123,877).[1] Theory suggested the use of total farm sales was a better indicator of the societal benefits. For each dollar spent or charged to farm business management education, society could expect to receive $9.06 in increased business activity.[2]

Electronic Farm Record Programs

With the development of the computer as a mechanism for accounting, an obvious undertaking was to extend computer application to farm business records.[3] The rapid development which followed was evidenced by the 1966 directory of electronic farm accounting programs Farm Journal presented.[4] See Table III. Since 1966, the number of electronic farm accounting programs has increased rapidly; particularly the commercially based operations.

A very instructive discussion of computer applications in farming was presented by Herder.[5] He identified two approaches to the use of electronic data processing: (1) special programs constructed to satisfy the specifications of an individual farm operation or of the interested program developer, and (2) general program constructed to satisfy specifications based upon the common needs of a variety of farm operations. Special programs are normally serviced by management firms and provide linear programming options in addition to accounting procedures. Herder stated "...these special programs are generally quite expensive and beyond the means of the average farmer."[6] General programs provide general accounting and management information. Notably, Herder indicated "Current programs available to farmers vary in value from virtually useless to extremely good."[7]

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[1] Ibid., p. 125.

[2] Ibid., p. 126.

[3] Reference to IBM, Agricultural Symposium (Endicott, New York: 1965) will provide a good sample of various electronic farm accounting systems.

[4] "Where to Ask About Electronic Farm Accounting," Farm Journal, January 1966, p. 59

[5] Richard J. Herder, "Computers, Farm Records and the Agricultural Banker" (9th District Banking Information Series, Federal Reserve Bank of Minneapolis, 1967), p. 1.

[6] Ibid., p. 5.

[7] Ibid., p. 6

TABLE III. 1966 DIRECTORY OF ELECTRONIC FARM ACCOUNTING SERVICES.[a]

State or Area	Project Started In	Main Objectives[b]
1. University-related		
University of Arizona	1962	1,3,4,5
University of California	1963	1,3,4,5
Eastern Regional Project "Elfac"	1961	1,4,5
Indiana-Purdue University	1963	1,4,5
Michigan State University	1959	1,3,4,5
University of Missouri	1961	1,4,5
Univeristy of Nebraska	1962	1,4,5
University of North Carolina	1964	1,4,5
North Dakota State University	1964	1,3,4,5
Pennsylvania State University	1962	1,3,4,5
Texas A & M University	1963	1,3,4,5
Western Regional Project	1964	1,3,5
University of Wisconsin ARC	1962	1,3,4,5
Virginia Polytechnic Institute	1959	1,3,4,5
2. State Farm Bureaus		
Connecticut	1965	1,2
Florida	1965	1,2,3,4
Georgia	1964	1,2,3,4
Iowa	1964	1,3,4
Maryland	1965	1,2
Ohio	1962	1,2,3,4
Oregon	1961	1,2,3
South Carolina	1965	1,2,3,4
3. Commercial		
Arizona and Western States - Western Farm Management Co.	1965	1,2,3,4,5
Illinois - J/D Farm Management Service	1965	1,3,4
Iowa - Nevada National Bank	1965	1,4
Wisconsin - Modern Records, Inc.	1964	1,3,4

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[a] Farm Journal, January 1966, p. 59.

[b] 1 - Tax records (monthly or quarterly financial reports)
2 - Tax filing service
3 - Cost and return for each enterprise on your farm
4 - General farm management analysis
5 - Research, education

As the Farm Journal indicated, the objectives of the various electronic farm record systems are quite diverse.[1] They included providing combinations of the following types of information: monthly and quarterly financial reports; tax filing reports; enterprise cash statements; analysis data; and research and teaching data.

Herder indicated that historically there has been a scheme of progressive refinement in the type of analysis detail, provided by electronic farm record services.[2] He outlined most of the options available, although not necessarily in one system.

1. Farm accounting reports - the simplest programs... provide a periodic listing of farm business transactions. More advanced programs...are generally broken into component parts...
   (a) Monthly or quarterly flow of funds report-- ...itemizes all income and expense transactions.
   (b) Tax summary reports--...a third quarter or 11-month summary for tax estimates... a complete year-end tax report.
   (c) Annual business analysis reports—Summary of inventory and depreciation schedule -Financial and net worth statement --Comparative farm business analysis.
   (d) Enterprise accounting--the advanced type of program...Enterprise accounting requires a considerable amount of detail in record keeping and is perhaps the least used or understood part of the current program.
2. Farm management reports: Most of the programs that provide for the full range of accounting reports are readily adaptable to provide information for management decisions...requires a great deal of farmer competence in providing the necessary data. Management reports are as yet in the developmental state and are used only on a limited basis...requires a great deal more expertise on the part of the service operator in instructing their clientele in the use and value of the information...:
   (a) Crop productivity and land use analysis
   (b) Power and machinery analysis
   (c) Feed and livestock efficiency analysis
   (d) Labor utilization analysis
   (e) Labor and Management return analysis
   (f) Linear programming
   (g) Capital budgeting analysis[3]

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[1] Farm Journal, p. 59.

[2] Herder, p. 6.

[3] Ibid., p. 6.

It should again be noted that a particular electronic farm record service may have only a few of the reports available in its basic program. In the typical development process, additional programs are added with an accompanying additional cost.

Of particular interest in this review is Herder's statement:

> "...there is still a major farmer education task ahead before large numbers will be interested in participation in these programs. There is no question, however, that a rapid increase in the number of farmers involved will occur in the next few years."[1]

Work Effort for the Program

While there are no definite time studies of the effort expended by instructors in operating a farm business management education program, instructor time is a limited and valuable commodity.

Peterson and Hemming suggested that it would be very helpful for a teacher to attempt to determine how many families he can properly instruct.[2] They illustrate the procedure as follows:

Teacher's time available annually		2000 hours
(40 hours weekly for 50 weeks)		
Time expenditure		
Administration including class preparation		400
(8 hours weekly for 50 weeks)		
Community service and school responsibilities		150
(3 hours weekly for 50 weeks)		
State conferences and other meetings		80
	Sub-total	630
Time available for farm calls		
(2000-630)		1370
Number of farmers to enroll		45
(1370 divided by 12 visits times 2.5 per visit)		
Class time in excess of budget		126
(3 classes of 14 meetings of 3 hours)		

It should be noted that experience would indicate that additional instructor time will be demanded at the time of closing yearly records. Painter recently commented "Even with as little as five hours closing time per book..."[3] Thus, a concervative estimate would be the equivalent of an an additional visit of two and one-half hours per family or an additional 112 hours of work for the closing period of about six weeks. Hypothetically then, an average work week for a 45 family program would include at least 45 hours of effort for 50 weeks (2248÷-50).

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[1] Ibid., p. 8.

[2] Peterson and Hemming, Farm Business Management: An Instructor's Guide, p. 8.

[3] Charles Painter, "Area Coordinator's Newsletter" (Austin: Austin Area Vocational-Technical School, April 1970), p. 2.

Analysis Center Time. A considerable portion of the time spent in analyzing records is utilized at the analysis centers. Smith reported that an average of 13.6 hours were consumed in the analysis of 47 books at the West Central School in 1955.[1] See Table IV. This was for the desk calculator type equipment.

TABLE IV. TIME CONSUMED ON THE ANALYSIS OF 47 BOOKS AT THE WEST CENTRAL SCHOOL IN 1955.[a]

Job	Hours per Book	Per Cent of Total
Adding Books	2.3	17
FA 20, FA 21, & FA 22	4.0	29
Feed & Crop Checks	.9	7
FA 24	3.0	22
Recapping	2.3	17
Copy Farmer's Figures in Report	1.1	8
Totals	13.6	100

[a] Ralph E. Smith, "The West Central School and Station as a Regional Center for Analysis of Farm Records in the West Central Area." p. 14.

Hodgkins reported that in 1967 the Mankato Area Analysis Center spent an average of 4.4 hours per record.[2] This figure included clerical time for re-adding books, completing data sheets, cross checking, checking printout against the data sheet, mimeographing and assembling the summary report. In 1968, the average time spent per record was 5.0 hours, but Hodgkins noted it was necessary to train new help. He felt the time would not have increased over 1967 had trained help been available. The importance of the experienced help being available is evident.[3]

The approximate 9.2 hours reduction (13.6-4.4) in time spent per record between 1955 and 1967 must be interpreted carefully. Obviously, experienced help would have reduced the 1955 average of 13.6 hours. But, even if this increased efficiency reduced the time required by hand calculation methods to 10 hours, the computerization of the calculation would have contributed to a 5.6 hour saving per record.

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[1] Smith, p. 14.

[2] Delbert L. Hodgkins, "Mankato Area Farm Management Analysis Center Financial Summary 1967 Farm Record Analysis," and personal notes requested by the author.

[3] Delbert L. Hodgkins, "Mankato Area Farm Analysis Center Financial Summary for 1968 Farm Record Analysis," and personal notes requested by the author.

Painter stated:

> The future of the analysis program is in no small measure dependent upon the quality of account books provided. I feel certain that we will soon be evaluated on the basis of 50 farm management cooperators to be approved for a full work load. To do this most of us will need to offer much more instruction in record keeping...The analysis center operates much more efficiently when good records are tabulated.[1]

He discussed an experiment of posting two good books from typical farm operations. A clerk checked, added and tabulated these two books in just under four hours--two hours per book. Reading back the tabulations took another half hour. He estimated a total time of three and one-half hours per book including overhead activities. This compared to the 1969 center average of nearly seven hours per book. Painted proposed that at four and one-half hours per book, his center could process another 120 books in January and February without expanding the size of his staff.

Record Keeping Time. The difficulty of motivating farmers to keep business and personal records is based in human nature. It has long been known that it is a Herculean task to motivate farmers to record time spent in keeping records as witnessed by the limited availability of time studies.

Ross conducted a study with the intent of providing factual information about the mechanics of farm record keeping.[2] Fifty farmers from the Southwestern Minnesota Farm Mangement Association composed the sample. Since all farms involved were experienced record keepers with the Minnesota Farm Account Book, the data is of particular interest because this account book is used by most farmers cooperating in the Vocational Agriculture Farm Business Management Programs. He reported an average of 42 hours and 20 minutes was spent working with the record book. Average entry time was 31 hours and 59 minutes. The remaining time was spent using the record information.[3]

Ross also noted that people with a positive attitude towards records tended to have more accurate records and tended to spend more time with their records.[1] He found the farmers with a "positive" attitude reported spending about 11 hours more time with their records than the farmers with a "positive but" attitude (50 hours versus 30 hours). The "positive, but" farmers spent about three hours more on their records than the "negative" farmers. He suggested that the positive attitude people spent more time on the record because they made more entry efforts and referals to their records.

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[1] Painter, "Area Coordinator's Newsletter," p. 2.

[2] Lyle M. Ross, "Study of Accuracy, Time, Attitudes, and Related Factors in Farm Record Keeping": (unpublished Master's dissertation, University of Minnesota, 1968), p. 5.

[3] Ibid., p. 25.

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[1] Ibid., p. 40.

CHAPTER IV

DEVELOPING A PLAN FOR FARM BUSINESS ANALYSIS

A concentrated workshop session was chosen as the medium for assembling teachers, specialists and record keeping technicians to tackle the problem of examining and reorganizing the record analysis system. A workshop of one week was organized to aim at the following objectives:

A. To assemble teachers, specialists, and record technicians so that they may share ideas on how best to keep and analyze farm business records.

B. To devise a plan for the orderly development and trial of a modern business record and development program.

C. To revise the format of the current record analysis system to take advantage of the new information available through the revised farm account book.

D. To stimulate interst in alternative record keeping forms by studying the input-output procedures and costs of systems currently available for use in vo-ag programs.

Selecting Participants

In discussion with the agricultural area coordinators of the area vocational-technical schools, it was generally agreed that the participants of this conference should be those who best understood the farm business management approach to adult education and who were already skilled in the use and interpretation of the business analysis. Since the conference was to utilize the participants as the chief resources for information, it was decided to restrict attendance to those identified as meeting the criteria outlined by the coordinators. They were:

A. Devote most or all of their time to adult instruction in farm management.

B. Have been analyzing records through the area center so they are familiar with the procedures.

C. Are judged to be competent in their ability to interpret the analysis.

Using these broad criteria, the area coordinators identified fifty-five vocational agriculture teachers to be invited to the workshop. Invitations were sent. Some had conflicts in scheduling or chose not to come, but fourty-four accepted.

The Conference Organization

Arrangements were made with a local motel to provide housing, meeting rooms for small group and large group work, and food service.

The program of activities for the workshop provided for maximum participation by the enrollees. A brief outline of the schedule of events for the workshop follows.

SCHEDULE OF EVENTS

Monday - Program Objectives and Analysis Review

8:00 - 9:00	Registration
9:00 - 9:10	Conference Call to Order
9:10 - 9:30	Conference Charge - Dr. Harry Kitts, Acting Chairman, Ag. Ed. Department
9:30 - 10:00	Conference Plan Reviewed; Assignments for Study Objectives
10:00 - 10:20	Coffee Break
10:20 - 10:30	Committee Organization
10:30 - 12:00	Committee Activity
12:00 - 1:00	Lunch
1:00 - 2:30	Compiling Program Objectives
2:30 - 2:45	Assignment for Review of Analysis
2:45 - 3:05	Coffee Break
3:05 - 5:00	Committee Activity

Tuesday - Review of Analysis Systems

9:00 - 10:00	Committee Reports on Minnesota Analysis Review
10:00 - 10:20	Coffee Break
10:20 - 11:00	Committee Reports on Minnesota Analysis - continued
11:00 - 12:00	Dept. of Agricultural Economics - Dr. Truman Nodland, Ken Thomas
12:00 - 1:00	Lunch
1:00 - 2:50	Agricultural Records Cooperative - Howard Oertel
2:50 - 3:10	Coffee Break
3:10 - 5:00	Production Credit Association - David Boorman

Wednesday - Study of Analysis Systems

9:00 - 9:30	Assignment for the Day
9:30 - 12:00	Committee and Individual Activity
12:00 - 1:00	Lunch
1:00 - 3:30	Committee and Individual Activity
3:30 - 5:00	Reports of Individuals and Committees on Adaptation from Other Analysis Reports

Thursday - Revision of Analysis

9:00 - 9:30	Assisnment for the Day
9:30 - 12:00	Committee Activity
12:00 - 1:00	Lunch
1:00 - 2:00	Exchange for Committee Review
2:00 - 4:00	Committee Activity
4:00 - 5:00	Reports of Committees

Friday - Validation of Analysis Revisions

9:00 - 9:30	Assignment for the Day
9:30 - 10:30	Committee Completion of Analysis Format and Validation
10:30 - 10:50	Coffee Break
10:50 - 12:00	Validation of Analysis Computation
1:00 - 3:00	Final Conference Report

Because the success of this conference was dependent upon controlled interaction of the participants and the production of specific outputs, the instructions for each day were prepared in written form and distributed to each conference member. By delimiting the scope of discussion for each group and providing specific instructions for reporting the results of the group activity, the topics assigned were adequately covered. The instructions are reported in conference procedure.

CONFERENCE PROCEDURE

Monday

9:30 - 12:00 Program Objectives

1. Review Conference Plan
    a. Day by day account of proposed activity.
    b. Assign room numbers for conference rooms.
    c. Ask for additions to daily agenda at the beginning of each morning session.
2. Assignment of Task
    a. Division of group into operating committees.
    b. Committee has 1 1/2 hours in which to write a statement of the general purpose of the farm management education program in vocational agriculture and to list what the committee considers to be the specific objectives of the instructional program.

    The committee will also outline the five most important general criteria the farm record and analysis system should meet in order to be most useful in meeting the objectives of the farm management education program.

The committee will use the following format for reporting back to the conference:

(1) The general purpose and specific objectives will be prepared in transparency form for projection in the 1:00 conference session. A written report of the objectives will be submitted to the general conference secretary.

(2) The five most important criteria will be presented both as a transparency and as a written report by the committee secretary. Written reports will be handed to the general conference secretary at the time of presentation.

Each reporter will be allowed only ten minutes in which to present his report and answer questions.

2:30 - 5:00 Review of Analysis

Each committee will make a systematic assessment of the current system in view of the general and specific objectives laid down by the conference participants.

The committee will review the analysis summary for the Austom. Mankato, Duluth, Morris, or Winona area, since these reports contain information as prepared by the current electronic analysis system.

Comments on each section of the analysis will be presented on a separate page to enable distribution of commentary to committees. Each committee will comment on all sections of the analysis. Reports will be specific in listing the strong and weak points of each analysis section.

Analysis review will be given by each committee secretary on Tuesday morning.

Tuesday - Primarily set aside to listen and inquire.

9:00 - 11:00 Review of Current System in Use

The Tuesday session will begin with a review of the current analysis system. Each committee secretary will present an oral review of the committees' comments and will present written copy to the general conference secretary. The conference secretary will sort the written responses according to topical area and see that they are distributed to the appropriate committee for action on Wednesday.

11:00 - 5:00 Review of Other Relevant Systems

Each speaker will be introduced stating the nature of his business and his qualifications for speaking on the topic. The following assignments for introduction are made:

Dr. Truman Nodland - Introduced by Del Hodgkins

Ken Thomas - Introduced by Del Hodgkins

Mr. Oertel, A.R.C. - Introduced by Edgar Persons

David Boorman - Introduced by Ed Sisler

Following each speaker's presentation, the floor will be returned to the person introducing the guest. A buzz session or Phillip 66 technique will be employed to solicit questions. Each group from the floor (about six in each) will be given six minutes to formulate two questions for the speaker. Questions will be asked in turn, one question from a group, until all questions have been satisfactorily answered. The speaker will be asked to limit his response to allow for all questions within the time limit specified on the program. All written materials supplied by the speakers will be made available for study the following day. Each temporary chairman will introduce the succeeding chairman.

The general conference secretary will record as much of the session as possible, and make record of all written materials supplied.

Wednesday - Study of Analysis Systems

The Wednesday session is principally informal with only a general outline or prescribed activity.

1. General Administrative Procedures

2. Supplementary Information Forms

3. Computer Data Sheets

While (1) and (2) cannot be effectively completed until the conference adjourns, the ground rules for completing these tasks can be established and an outline of the procedure to be followed can be prepared. The coordinators will meet at 9:30.

The conference will be instructed to study the events of the past two days, with specific attention to farm management program objectives, evaluation of the current analysis system and remarks by guests representing other forms of record analysis. The principal objective of the day is to study.

The final session at the close of the day is to bring together some of the ideas that have been gleaned by individuals and informal groups from the presentation of the guests and written materials that are available for study. Each participant is encouraged to submit, at the end of the day, a brief report of the specific items, general procedures or analysis concepts gleaned from the previous presentations that he feels are worthy of further examination.

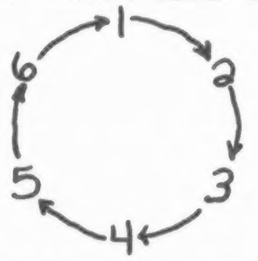
The closing session will be used to solicit response of those ideas that individuals feel are most important to include in the analysis program for vo-ag farm management instruction.

Thursday - Revision of Analysis

The group will work in committees, each committee with an assigned task. The committee will have several items available:

1. Copies of all analysis reports from Minnesota.
2. The Minnesota Farm Account Book, 9th Revisions.
3. Workshop reviews of the assigned area prepared by Monday.
4. Written materials from the guest presentation of Tuesday.
5. Individual and group suggestions for adaptation of materials as a result of Wednesday's session.
6. A plentiful supply of paper, rulers, pencils, and other necessary materials.

The committee will attack the task of review of their section of the report with vigor. Any revisions, deletions or additions will be prepared in rough-draft form by 1:00 p.m. At that time a spokesman from the committee will take the material to another committee for review and comment. He will record the review committee's reactions and suggestions. One hour will be devoted to such review. Committees will rotate in clock-like fashion.



The original committee will reassemble at 2:00 p.m. to begin the following tasks:

1. Complete revision of the analysis format and prepare for presentation to the conference at 3:30. All revisions to be prepared on transparency for conference review.

2. Validation of every printed item on the revised printout.

At 3:30, the conference will meet to review the progress of the day. Each committee will present their materials. The recording secretary from the committee reporting will take note of all discussion, questions and suggestions from the floor.

Friday - Final Revision and Validation

Suggestions from the previous evening's activity will be considered. Those revisions thought desirable will be made.

The primary task, however, will be validation of every item in the analysis. For instance, if a committee decides that the table on beef cattle should include an item entitled, "Death Loss," the committee must validate how this item is computed. They will, in long hand form, write the formula for computation including account book page and column numbers. The instructions must be so complete that any conference member, if he follows the instructions, will arrive at the same value for "Death Loss" as will any other member.

Without careful, accurate and complete validation of every analysis item, it will not be possible to develop a complete system of account analysis that is meaningful to everyone. Validation of items that are relatively standard should begin early Thursday so that the job is completed by the end of the conference on Friday.

The closing conference session will be a complete review of the proposed record analysis.

Post Conference

The area coordinators will need to assemble in order to edit the proposed analysis format and to decide on those changes that should be effected immediately. The data sheets are the most crucial development and must be developed first. They are necessary to permit development of instructions for computation of all the tables in the analysis. All work by coordinators and the Department of Agricultural Education must be completed no later than September 15 and earlier if at all possible.

Participants will be reminded that because of limitations in time, it will not be possible to plan highly innovative programs for the coming year. The procedures in development of a comprehensive analysis system should provide for adequate testing of any major revisions before they are incorporated in the record plan. It is hoped that funds and personnel for that kind of development will soon be available. The coordinators may find it necessary to assign priorities to the suggestions of conference participants and may find it necessary to delay implementation of some untried analysis procedures until funds for experimentation are available.

Assigning Participants to Groups

To equalize the attention given to each major problem in revising the business analysis, participants were assigned to committees prior to the beginning of the conference. Some who expressed interest in a particular area of the analysis were assigned on that basis. Each committee was chaired by one of the agriculture area coordinators.

Contribution of Specialists

To contribute to the objective of examining and evaluating alternative record keeping systems, several farm record specialists were invited to participate. Dr. Truman Nodland, University of Minnesota, began the presentations. Because his address served to guide the thought of many of the committee in their later deliberations, it is reproduced in this report.

FARM RECORDS FOR A CHANGING AGRICULTURE

Dr. Truman Nodland

Historical Review

Farm records have been an important tool in the management of Minnesota farms for most of this century. In the beginning, accounts were designed to determine what was happening to farm costs and farmer's earnings, rather than what should be done to improve farm organization and earnings. The data collected by frequent personal interviews were solely for use by researchers and involved detailed costs. Reports were not sent to the individual farmer who supplied the data. In fact, great care was taken to prevent him from securing the data for fear it would destroy the representativeness of the sample.

A radical change was inaugurated in the 1920's. Farmers who kept records for the University were provided with a summary of the results from their farm and thus were encouraged to make an analysis from the standpoint of the organization and operation of their farm. Detailed cost accounts were still the order of the day. They were costly and too detailed to interest many farmers.

The second major change occurred in 1928, when the Southwestern Minnesota Farm Management Service was established. This was patterned after the Farm Bureau-Farm Management Service which began in Illinois in 1924. The cooperative farm management service idea was unique in that it combined research, extension activities, and service to the individual farmer. Since it helped individual farms, they also contributed to its financial support. As a result, more farmers could be included with a given amount of research, teaching, and extension funds. In order to further reduce costs per farm, detailed labor records were omitted and the farmer was asked to keep records in a farm account book with the assistance of a fieldman.

The next major change in farm records is still in the developmental stage and is the result of the availability of high speed computers. The fact that the present day computer can handle a large volume of data has created a renewed interest in a mail in system of farm records, as well as the possibility of summarizing data from account books. Neither the monthly main in idea nor the use of computers in summarizing farm records is new. The first "mail in" system of records was started in 1913 in Minnesota and the first use of computers in summarizing farm account books in Minnesota took place in the late 1930's and involved some 2000 borrowers from the Farmers Security Administration.

Thus, the various systems of supervised farm records have gradually evolved into the present day three-way program: (1) They are a service to the individual farmers. (2) They are an educational tool which the extension service, the adult vocational agriculture instructor and representatives from the various agribusiness organizations can use in working with farmers, and they are a valuable classroom tool for use by the vocational agriculture and college instructor. (3) They are an important tool for the researcher in that it provides a continuous flow of financial and physical data in regard to farming.

The stress placed on the three main aspects of farm accounting varies but all are involved to some extent. The vocational agriculture instructor or the representative of an agribusiness firm will be primarily interested in service to farmers and the educational aspects of a program of farm records. However, there most likely will be cases when the records will be used in some research of specific problems. Also, the researcher is interested not only in gaining access to data for use in finding answers to certain questions or problems but he in turn will be interested in seeing the farmer and the teacher secure direct benefits from his work.

Role of Records in Farm Management

The importance of farm records is well known to individuals working with farmers and to an increasingly large number of farmers. Therefore, it might be worthwhile first to appraise the role records can and should plan in managing the modern farm business. With this as a criterion, we can then appraise the adequacy of what we are now doing.

Records are important as a m ans of evaluating the results of the farm business, as a basis for planning the business and as a means of controlling the cash flow and the credit aspects of the business.

Records are the most important source of information concerning the strong and weak points of a business by comparing results with the accomplishments of other farmers of a similar type, with accomplishments of previous years, with some ideal that one has developed from general knowledge, or with a prepared plan or budget. No other source of data can replace a well kept and accurate farm record in determining areas which need improvement and high income areas that might be enlarged. Net worth statements, earnings statements and other facts about the farm business are unexcelled as a means of determining progress (or lack of progress). Since the farm business and the affairs of the home are so closely associated, some record of household and personal expenses adds to the general appraisal.

Banks and other credit agencies are becoming more insistent on some record of performance by their farmer borrowers from which they can obtain an evaluation of probably loan repayment capacity. Net worth and earnings statements are important instruments in credit decisions.

Few farmers today need to be informed of the importance of records in preparing and filing income tax schedules. Capital gains and losses, investment credit, depreciation schedules and social security payments require complete and accurate records. The need for filing income tax returns is a sufficient reason for many farmers to attempt some type of record keeping system.

In addition to an analysis of past events, records provide some information for planning for the future. Forward planning is one of the truly important tasks of the farm manager. During years past, a farmer's records seemed to provide much of the information needed for budgeting and planning. With present day rapid changes in technology and more rapid shifts from one enterprise to another, other sources are needed. Each adoption of a new technology or change to an enterprise new to a particular farm results in changing cost structures based on anticipated costs rather than averages from the past. Records do continue to provide a basis for estimating the level of managerial ability and the farmer's current financial position.

With increased capital investment per farm and relatively narrow profit margins per unit of output, farmers are finding it necessary to use records to maintain control over the business. Many do not realize realize that they may be "living up" their capital investment until it becomes necessary to replace large capital items. Records provide information concerning excessive use of capital for living expenses and if it is possible to meet credit commitments on schedule.

Some Considerations for the Future

What changes can we propose in our system of farm records for farmers, bearing in mind the objectives and limitations which have been listed. We must consider that high speed computers make calculations possible that we could not consider under alternative types of office machines, as well as some changes in the emphasis on some of the objectives.

Increased capital requirements in farming is making credit more vital for most farmers. We should add a second net worth statement for many farmers that takes into account actual market values of farm property rather than book values based on cost. This might be considered as a special service which takes into account the great need for credit in present day farming operations. For many, an adjustment in real estate values is sufficient. For others, especially farmers who are using cost of production as a basis for valuing livestock and crops and those who are using rapid rates of depreciation on machinery and equipment for tax purposes, a complete reevaluation of all farm property for a credit statement is important. I do not believe a revised net worth statement for credit purposes needs to be included in the annual reports which are prepared from account book information. The amount of adjustment in the present net worth statement would depend on the individual farmer's need for a more accurate credit instrument.

I do not anticipate major changes in the various earnings statement in the immediate future. As farm businesses grow in terms of capital investment, we may wish to include return to capital or rate earned on investment as an alternative measure of earnings. This might be considered when the charge for the use of capital managed exceeds the value of the operator's labor (and management) by a substantial margin. Calculating return to capital does create a problem of placing a value on labor performed by the operator and possibly some kind of value reflecting the management function. I am inclined to the idea of calculating rate earned on investment for a few of the larger operations on an individual basis, rather than including this in the annual reports at present.

Little has been done in the way of determining costs of producing crops. In the past, variable costs in crop production have been small in comparison to such costs in the production of livestock. In livestock, one variable cost, feed, makes up 50-80 per cent of all costs. Thus, return over feed was a logical calculation to make. With increased variable costs in terms of fertilizers and chemicals of all kinds, we should consider the calculation of return to crops over major variable costs. The recent revision of the Minnesota Farm Account Book makes this a possibility.

In my opinion, only minor changes need to be made in the livestock statements. For example, the breakdown of total concentrates between corn, small grain and commercial feeds is becoming outdated in hog production because of the increased use of complete feed by some producers.

Computers make it possible to determine receipts and expenses on a "per acre" or some other basis. Such information can lead to more stress on the maximization of returns from most scarce resources. Also, calculations of this nature offer the possibility of stressing the need for more capital investment in some cases and over capitalization in others.

It is possible that our major measures of farm organization and management efficiency need to be revised. This should be done as research indicates possible changes. On the basis of observation, the present calculation of per cent tillable land in high return crops may be the one in most serious error.

2

We should investigate more thoroughly and on occasion try some "mail-in" system of farm records. Much needs to be done to improve this system for farmers who want a rather complete set of records. The mail-in system has both advantages and disadvantages in comparison to an account book. The primary advantage of a mail-in system is the possibility it offers for studying the cash flow of a business.

There seems to be increasing interest in a return to more detailed cost accounting. In my opinion, this is a result of more specialization in present day farming as well as the ability of high speed computers to handle a large volume of data. Researchers have not, however, come up with adequate methods of allocating costs to the farm enterprises in spite of their efforts over the past 65 years. Until we can determine a sound way of allocating costs, I do not see much reason for going to this detail on a large number of farms. Part of the problem is that the analysis of a farm business must be personalized instead of generalized. Each analysis must be tailormade to fit the one business involved. Unless we are careful, we can give the farmer incorrect information which can result in disaster rather than assistance. For example, on many farms in Minnesota, livestock enterprises will not yield a return sufficiently large to cover all costs under the usual methods of allocating costs. Much of the labor and fixed costs of power must be carried by crops. This does not mean that livestock enterprises should be eliminated on some farms. It does mean that after farmers have made investments in labor, power, and machinery to take care of peak demands by crops, he has unused resources which can be used in livestock production. Furthermore, so much of our farm planning involves technologies which do not exist on a farm at present. An entirely new set of cost curves must be constructed instead of a reliance on existing cost structures.

Some Conclusions

Instead of numerous changes in our annual reports, we need to concentrate on the job of using what we already have in a more adequate fashion. If we have time, we need to do more in the farm and home planning area, rather than concentrate on more details in an account book. Time spent in gathering more facts may yield a lower return for your efforts than time spent on planning a farm for the future. We might logically concentrate additional effort on procedures and materials we can use in farm planning. This is complicated by the fact that each farm plan must fit one particular farm with all the pecularities of goals and value judgements of that one farm family. It is a big task to assemble information relative to the new technologies which can be incorporated into farm planning and keep the information up to date. Here is an area where you can make a real contribution.

Following Dr. Nodland's address, Dr. Ken Thomas, Extension Farm Management Specialist addressed the group. He helped to point out some of the directions which he thought record analysis systems should take to be of the most assistance to farmers and educators.

Summaries of the objectives, outcomes, and procedures for two alternative forms of farm business records were reviewed. The AGRIFAX farm record system was described by David Boorman, Intermediate Credit Bank, St. Paul. The Electronic Farm Record System of Agriculture Records Cooperative, Madison, Wisconsin, was reviewed by Howard Oertel, Director. Because the descriptions of both systems are available from their source, they are not included in this report.

The report of the alternative record keeping systems served to inform the participants of some of the possible additions to the Minnesota record analysis program. One of the major outcomes of the presentations by the record specialists was the recommendation by committees that a pilot program for testing the mail-in form of farm data retrieval be developed, thus charting the course for the long range development of a record keeping - analysis plan for Minnesota.

Outcomes of the Conference

The principle interest in the workshop was in the final outcome. The objectives of revising the format of the business analysis system was satisfied by the committee suggestions. Each committee submitted suggestions for revision of the format for the sections assigned to them.

Following the conference, the project staff, using the suggestions of the committee, prepared a new format for each of the output tables in the business analysis. Care was taken to use the same reporting procedure for each livestock enterprise to permit easy interpretation of the completed analysis. A number of items suggested by committees but not considered feasible additions to the reports were eliminated from the final draft of the printout formats.

A significant addition to the record analysis was an attempt to handle each field crop as a separate enterprise. Since the revised accounting system had allowed for assignment of costs and returns by crop, the project staff devised a suitable means of reporting each crop on an enterprise basis. This change resulted in the addition of twenty-six tables in the completed analysis--one for each crop from which income could be reported.

The controversial issue of allocating certain operating and fixed costs to crops was also considered. A final decision to allocate costs such as machinery and equipment costs and a land charge to each crop met with widespread approval among the farm record cooperators.

The final outcome of the decisions of workshop can best be illustrated by a review of the reporting format for the farm business analysis. In the pages which follow, the format suggested by the conference participants, designed by the project staff, and edited and modified by the agriculture coordinators is presented. Later minor modifications of the report format are incorporated in this text so that the format exhibited is the one currently in use. They are presented in the exact form in which they are delivered by the computer center to each farm cooperator.

Record Analysis Format

(Code No.) ______ (Cooperator's Name) ____________ (Processing Date) ____________

TABLE 1 - FARM INVENTORIES - 19__ __

1 SIZE OF FARM-TOTAL ACRES ____
2 -TILLABLE ACRES ____
3 WORK UNITS-CROPS ____
4 -LIVESTOCK ____
5 -OTHER ____
6 TOTAL SIZE OF BUSINESS IN WORK UNITS ____
7 NUMBER OF WORKERS ____

		JAN. 1	DEC. 31
8	PRODUCTIVE LIVESTOCK	____	____
9	DAIRY COWS	____	____
10	OTHER DAIRY CATTLE	____	____
11	BEEF BREEDING CATTLE	____	____
12	BEEF FEEDER CATTLE	____	____
13	HOGS	____	____
14	SHEEP (INCL. FEEDERS)	____	____
15	POULTRY (INCL. TURKEYS)	____	____
16	OTHER PRODUCTIVE LIVESTOCK	____	____
17	TOTAL PRODUCTIVE LIVESTOCK	$____	____*
18	CROP, SEED AND FEED	____	____
19	POWER, MACHINERY AND EQUIPMENT		
20	AUTO AND TRUCK (FARM SHARE)	____	____
21	POWER AND MACHINERY	____	____
22	LIVESTOCK EQUIPMENT	____	____
23	TOTAL POWER, MACHINERY AND EQUIPMENT	$____	____*
24	LAND	____	____
25	BUILDINGS-FENCES-ECT.	____	____
26	TOTAL FARM CAPITAL	$____	____*

EXHIBIT A - RECORD ANALYSIS FORMAT

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 2A - WHOLE FARM SUMMARY OF CASH RECEIPTS - 19 __ __

1 SALE OF LIVESTOCK AND LIVESTOCK PRODUCTS
2 DAIRY COWS $_____
3 DAIRY PRODUCTS _____
4 OTHER DAIRY CATTLE _____
5 BEEF BREEDING CATTLE _____
6 BEEF FEEDER CATTLE _____
7 HOGS _____
8 SHEEP AND WOOL _____
9 CHICKENS (INCL. HENS AND BROILERS) _____
10 TURKEYS _____
11 EGGS _____
12 OTHER PRODUCTIVE LIVESTOCK _____

13 SALE OF CROPS
14 CORN _____
15 SOYBEAN, FLAX, SUNFLOWERS _____
16 WHEAT, OATS, BARLEY, RYE _____
17 POTATOES, SUGAR BEETS, CANNING & OTHER CROPS A+B _____
18 HAY, SILAGE AND OTHER CROPS _____
19 DIVERTED ACRE PAYMENT _____
20 CAPITAL ASSETS SOLD _____
21 GAS TAX REFUND _____
22 INCOME FROM WORK OFF THE FARM _____
23 PATRONAGE REFUNDS _____
24 MISCELLANEOUS FARM INCOME _____
25 TOTAL FARM SALES $_____*

26 INCREASE IN FARM CAPITAL _____
27 FAMILY LIVING FROM THE FARM _____
28 TOTAL FARM RECEIPTS (25) + (26) + (27) $_____*

29 ADJUSTED TOTAL FARM SALES (25) - (20) _____
30 TOTAL CASH FARM OPERATING EXPENSE _____
31 NET CASH OPERATING INCOME $_____*

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 2B - WHOLE FARM SUMMARY OF CASH EXPENSES - 19 __ __

1 PURCHASE OF LIVESTOCK $ ______
2 DAIRY COWS ______
3 OTHER DAIRY CATTLE ______
4 BEEF BREEDING CATTLE ______
5 BEEF FEEDER CATTLE ______
6 HOGS ______
7 SHEEP ______
8 CHICKENS (INCL. HENS AND BROILERS) ______
9 TURKEYS ______
10 OTHER PRODUCTIVE LIVESTOCK ______
11 MISCELLANEOUS LIVESTOCK EXPENSE ______
12 FEED BOUGHT ______
13 FERTILIZER ______
14 CHEMICALS ______
15 OTHER CROP EXPENSE ______
16 CUSTOM WORK HIRED ______
17 REPAIR + UPKEEP OF LIVESTOCK EQUIP. ______
18 REPAIR + UPKEEP ON FARM REAL ESTATE ______
19 GAS, OIL, GREASE BOUGHT (FARM SHARE) ______
20 REPAIR + OPER OF MACH, TRACTOR, TRUCK, AUTO (F.S.) ______
21 WAGES OF HIRED LABOR ______
22 PERSONAL PROPERTY + REAL ESTATE TAXES ______
23 GENERAL FARM EXPENSE ______
24 TELEPHONE EXPENSE (FARM SHARE) ______
25 ELECTRICITY EXPENSE (FARM SHARE) ______
26 TOTAL CASH OPERATING EXPENSE $ ______*

27 POWER, CROP AND GENERAL MACH BOUGHT (FARM SHARE) ______
28 LIVESTOCK EQUIPMENT BOUGHT ______
29 NEW REAL EATATE + IMPROVEMENTS ______
30 TOTAL FARM PURCHASES (26) THRU (29) ______

31 DECREASE IN FARM CAPITAL ______
32 INTEREST ON FARM CAPITAL ______
33 UNPAID FAMILY LABOR ______
34 LABOR CHARGE FOR PARTNERS + OTHER OPERATORS ______
35 BOARD FURNISHED HIRED LABOR ______
36 TOTAL FARM EXPENSE (30) THRU (35) $ ______*

37 LABOR EARNINGS (WHOLE FARM) (2A/28) - (36) $ ______*
38 NUMBER OF OPERATORS ______

(Code No.) ------- (Cooperator's Name) ______ (Processing Date) ______

TABLE 3 - ENTERPRISE STAT. - 19 __ __

1 RETURNS AND NET INCREASES

2 PRODUCTIVE LIVESTOCK
3 DAIRY CATTLE $______
4 OTHER DAIRY CATTLE ______
5 BEEF BREEDING CATTLE ______
6 FEEDER CATTLE ______
7 COMPLETE HOG ENTERPRISE ______
8 HOG FINISHING ENTERPRISE ______
9 PRODUCING WEANING PIGS ______
10 FARM FLOCK OF SHEEP ______
11 FEEDER LAMBS ______
12 CHICKENS (INCL. HENS AND BROILERS) ______
13 TURKEYS ______
14 OTHER PRODUCTIVE LIVESTOCK ______
15 ALL PRODUCTIVE LIVESTOCK $______*
16 VALUE OF FEED FED TO LIVESTOCK ______
17 RETURN OVER FEED FROM LIVESTOCK ______
18 CROP, SEED AND FEED ______
19 INCOME FROM LABOR OFF THE FARM ______
20 COOPERATIVE PATRONAGE REFUNDS ______
21 MISCELLANEOUS FARM INCOME ______

22 TOTAL RETURNS AND NET INCREASES $______*

23 EXPENSES AND NET DECREASES $______

24 TRUCK AND AUTO (FARM SHARE) $______
25 TRACTORS AND CROP MACHINERY ______
26 ELECTRICITY ______
27 LIVESTOCK EQUIPMENT ______
28 BUILDINGS, FENCES AND TILLING ______
29 BARE LAND ______
30 MISC. LIVESTOCK EXPENSE ______
31 LABOR ______
32 LABOR CHARGE FOR OTHER OPERATOR(S) ______
33 PROPERTY TAX ______
34 GENERAL FARM EXPENSE AND TELEPHONE ______
35 INTEREST ON FARM CAPITAL ______

36 TOTAL EXPENSES AND NET INCREASES $______*

37 LABOR EARNINGS $______
38 NUMBER OF FARM OPERATORS ______

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 4 - HOUSEHOLD EXPENSE - 19 __ __

1 NUMBER OF PERSONS - FAMILY ______
2 NUMBER OF ADULT EQUIVALENT-FAMILY ______
3 CHURCH AND WELFARE $______*
4 MEDICAL CARE AND HEALTH INSURANCE ______
5 FOOD AND MEALS BOUGHT ______
6 OPERATING EXPENSE AND SUPPLIES ______
7 FURNISHINGS AND EQUIPMENT ______
8 CLOTHING AND CLOTHING MATERIALS ______
9 PERSONAL CARE, PERSONAL SPENDING ______
10 EDUCATION ______
11 RECREATION ______
12 GIFTS AND SPECIAL EVENTS ______
13 PERS. SHARE TRUCK AND AUTO EXP. ______
14 OPER. SHARE UPKEEP ON DWELLING ______
15 PERS. SHARE TEL. AND ELECT. EXP. ______
16 TOTAL CASH LIVING EXPENSES $______*
17 PERS. SHARE NEW TRUCK AND AUTO ______
18 NEW DWELLING BOUGHT ______
19 TAXES AND OTHER DEDUCTIONS ______
20 LIFE INSURANCE AND OTHER SAVINGS AND INVESTMENTS ______
21 TOTAL HOUSEHOLD AND PERSONAL (16) - (20) $______*
22 TOTAL FAMILY LIVING FROM THE FARM (33) ______
23 TOTAL CASH AND NON-CASH EXPENSES (21) + (22) $______*

24 FAMILY LIVING FROM THE FARM

		AMOUNT $	OPR SHARE
25			
26	MILK AND CREAM	______	______
27	BEEF	______	______
28	PORK	______	______
29	LAMB	______	______
30	POULTRY	______	______
31	EGGS	______	______
32	VEG., FRUIT, SPUDS, AND FUEL-ALSO OTHER PRODUCE	______	______
33	TOTAL FAMILY LIVING FROM THE FARM	______	$______*

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 5 - NEW WORTH STATEMENT-OPERATOR - 19 __ __

	JAN. 1	DEC. 31
1 TOTAL PRODUCTIVE LIVESTOCK	$______	______
2 CROP, SEED AND FEED	______	______
3 TOTAL POWER, MACHINERY AND EQUIPMENT	______	______
4 LAND	______	______
5 BUILDINGS, FENCES, ETC.	______	______
6 TOTAL FARM CAPITAL	______	______
7 NON-FARM ASSETS		
8 DWELLING	______	______
9 TOTAL ASSETS	$______	______
10 REAL ESTATE MORTGAGES		
11 CHATTEL MORTGAGES	______	______
12 NOTES	______	______
13 ACCOUNTS PAYABLE	______	______
14 TOTAL LIABILITIES	$______	______
15 FARMERS NET WORTH	$______	______
16 GAIN OR (LOSS) IN NET WORTH		$______

* * *

17 SUPPLEMENTARY MANAGEMENT INFORMATION

18 OPERATORS LABOR EARNINGS (6B/39)	$______	
19 RETURN TO CAPITAL AND FAMILY LABOR (6B/40)	______	
20 NON-FARM INCOME	______	
21 OUTSIDE INVESTMENT INCOME	______	
22 OTHER PERSONAL INCOME	______	
23 TOTAL NON-FARM INCOME	$______	
24 TOTAL MONEY BORROWED	______	
25 TOTAL PAID ON DEBT (PRINCIPAL)	______	
26 TOTAL HOUSEHOLD + PERSONAL CASH EXP. (4/21)	______	
27 RATIO TOTAL FARM EXPENSES TO TOTAL FARM RECEIPTS	______	
28 RATIO TOTAL ASSETS TO TOTAL LIABILITIES	JAN. ______	DEC. ______

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 6A - OPERATORS SHARE OF CASH RECEIPTS - 19 __ __

1	SALE OF LIVESTOCK AND LIVESTOCK PRODUCTS	
2	DAIRY COWS	$____
3	DAIRY PRODUCTS	____
4	OTHER DAIRY CATTLE	____
5	BEEF BREEDING CATTLE	____
6	BEEF FEEDER CATTLE	____
7	HOGS	____
8	SHEEP AND WOOL	____
9	CHICKENS (INCL. HENS AND BROILERS)	____
10	TURKEYS	____
11	EGGS	____
12	OTHER PRODUCTIVE LIVESTOCK	____
13	SALE OF CROPS	
14	CORN	
15	SOYBEANS, FLAX, SUNFLOWERS	____
16	WHEAT, OATS, BARLEY, RYE	____
17	POTATOES, SUGAR BEETS, CANNING & OTHER CROPS A+B	____
18	HAY, SILAGE AND OTHER CROPS	____
19	DIVERTED ACRE PAYMENT	____
20	CAPITAL ASSETS SOLD	____
21	GAS TAX REFUND	____
22	INCOME FROM WORK OFF THE FARM	____
23	PATRONAGE REFUNDS	____
24	MISCELLANEOUS FARM INCOME	____
25	TOTAL FARM SALES	$____*
26	INCREASE IN FARM CAPITAL	
27	FAMILY LIVING FROM THE FARM	____
28	TOTAL FARM RECEIPTS (25) + (26) + (27)	$____*
29	ADJUSTED TOTAL FARM SALES (25) - (20)	
30	TOTAL CASH FARM OPERATING EXPENSE	____
31	NET CASH OPERATING INCOME	$____*

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 6B - OPPERATORS SHARE OF CASH EXPENSES - 19 __ __

1 PURCHASE OF LIVESTOCK $______
2 DAIRY COWS ______
3 OTHER DAIRY CATTLE ______
4 BEEF BREEDING CATTLE ______
5 BEEF FEEDER CATTLE ______
6 HOGS ______
7 SHEEP ______
8 CHICKENS ______
9 TURKEYS
10 OTHER PRODUCTIVE LIVESTOCK ______
11 MISCELLANEOUS LIVESTOCK EXPENSE ______
12 FEED BOUGHT ______
13 FERTILIZER ______
14 CHEMICALS ______
15 OTHER CROP EXPENSE ______
16 CUSTOM WORK HIRED ______
17 REPAIR + UPKEEP OF LIVESTOCK EQUIP. ______
18 REPAIR + UPKEEP OF FARM REAL ESTATE ______
19 GAS, OIL, GREASE BOUGHT (FARM SHARE) ______
20 REPAIR + OPER OF MACH, TRACTOR, TRUCK, AUTO (F.S.) ______
21 WAGES OF HIRED LABOR ______
22 PERSONAL PROPERTY + REAL ESTATE TAXES ______
23 CASH RENT ______
24 GENERAL FARM EXPENSE ______
25 TELEPHONE EXPENSE (FARM SHARE) ______
26 ELECTRICITY EXPENSE (FARM SHARE) ______
27 INTEREST EXPENSE ______
28 TOTAL CASH OPERATING EXPENSE $______*

29 POWER, CROP AND GENERAL MACH BOUGHT (FARM SHARE) ______
30 LIVESTOCK EQUIPMENT BOUGHT ______
31 NEW REAL ESTATE + IMPROVEMENTS ______
32 TOTAL FARM PURCHASES (28) THRU (31) $______*

33 DECREASE IN FARM CAPITAL ______
34 INTEREST ON FARM CAPITAL ______
35 UNPAID FAMILY LABOR ______
36 LABOR CHARGE FOR PARTNERS + OTHER OPERATORS ______
37 BOARD FURNISHED HIRED LABOR ______
38 TOTAL FARM EXPENSE (32) THRU (37) $______*

39 LABOR EARNINGS (OPERATORS SHARE) (6A/28) - (38) $______
40 RETURN TO CAPITAL AND FAMILY LABOR $______

(Code No.) ------   (Cooperator's Name) ______   (Processing Date) ______

TABLE 8 - MEASURES OF FARM ORGANIZATION - 19 __ __

1 LABOR EARNINGS $______
2 CROP YIELDS-INDEX ______
3 PERCENT TILL. LAND IN H.R. CROPS ______
4 GROSS RETURN PER TILL. ACRE (EXCL. PASTURE) $______
5 RETURN FOR $100 TO PROD. LIVESTOCK-INDEX ______
6 LIVESTOCK UNITS PER 100 ACRES* ______
7 SIZE OF BUSINESS - WORK UNITS ______
8 WORK UNITS PER WORKER ______
9 POWER MACH., EQUIP., BLDG. EXP. PER WORK UNIT $______
10 FARM CAPITAL INVESTMENT PER WORKER $______

11 INDEX OF RETURN FOR $100 FEED FROM
12 COMPLETE HOG ENTERPRISE ______
13 HOG FINISHING ENTERPRISE ______
14 PRODUCING WEANING PIGS ______
15 DAIRY CATTLE ______
16 OTHER DAIRY ______
17 ALL DAIRY AND DUAL PURPOSE CATTLE ______
18 BEEF BREEDING CATTLE ______
19 BEEF FEEDER CATTLE ______
20 SHEEP FARM FLOCK ______
21 FEEDER LAMBS ______
22 CHICKENS-LAYING FLOCK ______
23 CHICKENS-BROILERS ______
24 TURKEYS-LAYING FLOCK ______
25 TURKEYS-POULTS ______
26 OTHER PRODUCTIVE LIVESTOCK ______

27 NUMBER OF ANIMAL UNITS ______

28 WORK UNITS
29 CROPS ______
30 PRODUCTIVE LIVESTOCK ______
31 OTHER PRODUCTIVE WORK UNITS ______

32 EXPENSES PER WORK UNIT
33 TRACTOR AND CROP MACHINERY EXPENSE $______
34 FARM SHARE OF AUTO AND TRUCK EXPENSE $______
35 FARM SHARE OF ELECTRICITY EXPENSE $______
36 LIVESTOCK EQUIPMENT EXPENSE $______
37 BUILDING, FENCING, AND TILLING EXPENSE $______
38 TRACTOR AND CROP MACH. EXPENSE PER CROP ACRE** $______

39 *ACRES INCLUDE ALL TILLABLE LAND, NON-TILLABLE HAY AND PASTURE

40 **ACRES INCLUDE ALL TILLABLE LAND PLUS ACRES IN WILD HAY

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 9 - CROP PRODUCTION - 19 __ __

		UNIT	CROP BANK	ACRES	YIELD PER ACRE
1	OATS AND MIXTURES	BUS		___	___
2	OATS AND SILAGE	TON		___	___
3	CANNING PEAS	$		___	___
4	WHEAT	BUS		___	___
5	BARLEY	BUS		___	___
6	FLAX	BUS		___	___
7	RYE	BUS		___	___
8	TOTAL SMALL GRAIN AND PEAS			___	
9	CANNING CORN	$		___	___
10	CORN GRAIN AND SEED CORN	BUS		___	___
11	SOYBEANS-GRAIN	BUS		___	___
12	CORN AND CANE SILAGE	TON		___	___
13	CORN AND CANE FODDER	TON		___	___
14	POTATOES	CWT		___	___
15	SUGAR BEETS	TON		___	___
16	SUNFLOWERS	CWT		___	___
17	OTHER CULTIVATED CROPS - A	$		___	___
18	OTHER CULTIVATED CROPS - B	$		___	___
19	TOTAL CULTIVATED CROPS	$		___	___
20	ALFALFA HAY	TON		___	___
21	OTHER LEGUME HAY AND MIXTURES	TON		___	___
22	TAME GRASS HAY	TON		___	___
23	ANNUAL HAY	TON		___	___
24	LEGUME AND GRASS SILAGE	TON		___	___
25	LEGUME SEED	LBS		___	___
26	GRASS SEED	LBS		___	___
27	TOTAL HAY			___	
28	ALFALFA AND MIXED PASTURE			___	
29	OTHER LEGUME PASTURE			___	
30	OTHER TILLABLE PASTURE			___	
31	TOTAL TILLABLE PASTURE			___	
32	DIVERTED ACRES INCOME	$		___	___
33	SUMMER FALLOW - TILLED			___	
34	OTHER TILLABLE LAND IDLE			___	
35	TOTAL TILLABLE LAND			___	
36	WILD HAY	$		___	___
37	NON-TILLABLE PASTURE	$		___	___
38	TIMBER	$		___	___
39	ROADS AND WASTE			___	
40	FARMSTEAD			___	
41	TOTAL ACRES IN FARM			___	
42	SUPPLEMENTARY MANAGEMENT INFORMATION				
43	PERCENT LAND TILLABLE				___
44	PERCENT IN HIGH RETURN CROPS				___
45	*FERTILIZER COST PER ACRE				___
46	*CROP CHEMICALS PER ACRE				___
47	*SEED AND OTHER COSTS PER ACRE				___
48	*GAS, OIL, GREASE BOUGHT PER ACRE				___

49*TILLABLE LAND MINUS PASTURE

(Code No.) _ _ _ _ _ _ (Cooperator's Name) ____________ (Processing Date) ____________

TABLE 10 - CROP DATA FOR OATS AND MIXTURES - 19 __ __

		PER UNIT	TOTAL	PER ACRE
1	ACRES			
2	YIELD/ACRE		____	
3	VALUE/UNIT			____
4	GROSS RETURN		____	____
5	SUPPLEMENTAL COSTS			
6	FERTILIZER			
7	CHEMICALS			____
8	SEED AND OTHER			____
9	HIRED LABOR			____
10	CUSTOM WORK			____
11	TOTAL SUPPLEMENTAL COSTS			____
12	RETURN OVER SUPPLEMENTAL COSTS		____	____
13	ALLOCATED COSTS			
14	POWER AND CROP MACHINERY EXPENSE			
15	LAND COST			____
16	MISCELLANEOUS COSTS			____
17	TOTAL ALLOCATED COSTS		____	____
18	TOTAL COSTS	____	____	____
19	RETURN OVER TOTAL COSTS		____	____

Table 10, as illustrated above, is computed for each of the following crops:

1. Flax
2. Barley
3. Wheat
4. Oats and Oat Mixtures
5. Rye
6. Canning Peas
7. Potatoes
8. Sugar Beets
9. Other Cultivated Crops A
10. Other Cultivated Crops B
11. Sunflowers
12. Oat Silage
13. Canning corn
14. Corn for Grain
15. Hybrid Seed Corn
16. Soybeans
17. Corn and Cane Silage
18. Corn and Cane Fodder
19. Alfalfa Hay
20. Other Legume Hay and Mixtures
21. Tame Grass Hay
22. Annual Hay
23. Legume and Grass Silage
24. Legume Seed
25. Grass Seed
26. Diverted Acres

(Code No.) ------ (Cooperator's Name) ______ (Processing Date) ______

TABLE 11A - COSTS AND RETURNS FROM COMPLETE HOG ENTERPRISE - 19 __ __

		HERD TOTAL	PER CWT. PORK
1	POUNDS OF HOGS PRODUCED	______	
2	TOTAL VALUE PRODUCED	$______	______
3	POUNDS OF FEED FED		
4	CORN		______
5	SMALL GRAIN		______
6	PROTEIN, SALT AND MINERAL		______
7	COMPLETE RATION		______
8	TOTAL CONCENTRATES		______
9	FORAGES		
10	FEED COSTS		
11	CONCENTRATES AND FORAGES		______
12	PASTURE		______
13	TOTAL FEED COSTS	$______	______
14	RETURN OVER FEED COSTS	$______	______
15	SUPPLEMENTAL COSTS		______
16	MISCELLANEOUS LIVESTOCK EXPENSE		______
17	VETERINARY EXPENSE		______
18	CUSTOM WORK		______
19	TOTAL SUPPLEMENTAL COSTS	$______	______
20	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$______	______

* * *

21	SUPPLEMENTARY MANAGEMENT INFORMATION	
22	RETURN FOR $100 FEED FED	$______
23	PRICE RECEIVED PER CWT.	$______
24	NUMBER OF LITTERS FARROWED	______
25	NUMBER OF PIGS BORN PER LITTER	______
26	NUMBER OF PIGS WEANED PER LITTER	______
27	PER CENT DEATH LOSS	______
28	AVERAGE WEIGHT OF HOGS SOLD	______
29	PRICE PER CWT. CONCENTRATE FED	$______
30	POUNDS OF PORK PURCHASED	______

(Code No.) ------ (Cooperator's Name) ________ (Processing Date) ________

TABLE 11B - COSTS AND RETURNS FROM HOG FINISHING ENTERPRISE - 19 __ __

	HERD TOTAL	PER CWT. PORK
1 AVERAGE NUMBER OF PIGS ON HAND	____	
2 POUNDS OF HOGS PRODUCED	____	
3 TOTAL VALUE PRODUCED	$____	____
4 POUNDS OF FEED FED		
5 CORN		____
6 SMALL GRAIN		____
7 PROTEIN, SALT AND MINERAL		____
8 COMPLETE RATION		____
9 TOTAL CONCENTRATES		____
10 FORAGES		
11 FEED COST		
12 CONCENTRATES AND FORAGES		____
13 PASTURE		
14 TOTAL FEED COSTS	$____	____
15 RETURN OVER FEED COST	$____	____
16 SUPPLEMENTAL COSTS		
17 MISCELLANEOUS LIVESTOCK EXPENSE		
18 VETERINARY EXPENSE		____
19 CUSTOM WORK		____
20 TOTAL SUPPLEMENTAL COSTS	$____	____
21 RETURN OVER FEED AND SUPPLEMENTAL COSTS	$____	____

* * *

22 SUPPLEMENTAL MANAGEMENT INFORMATION	
23 RETURN FOR $100 FEED FED	$____
24 PRICE RECEIVED PER CWT.	$____
25 AVERAGE WEIGHT OF PIGS SOLD	____
26 AVERAGE PRICE PAID PER PIG BOUGHT	$____
27 AVERAGE WEIGHT PER PIG BOUGHT	____
28 NUMBER OF PIGS PURCHASED	____
29 POUNDS OF PORK PURCHASED	____
30 PER CENT DEATH LOSS	____
31 PRICE PER CWT. CONCENTRATE FED	$____

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 11C - COSTS AND RETURNS FROM PRODUCING WEANING PIGS - 19 __ __

		HERD TOTAL	PER LITTER
1	NUMBER OF LITTERS FARROWED	____	____
2	TOTAL VALUE PRODUCED	____	____
3	POUNDS OF FEED FED		
4	CORN	____	____
5	SMALL GRAIN	____	____
6	PROTEIN, SALT AND MINERAL		____
7	COMPLETE RATION		____
8	TOTAL CONCENTRATES		____
9	FORAGES		____
10	FEED COST		
11	CONCENTRATES AND FORAGES		____
12	PASTURE		____
13	TOTAL FEED COSTS	$____	____
14	RETURN OVER FEED COST	$____	____
15	SUPPLEMENTAL COSTS		____
16	MISCELLANEOUS LIVESTOCK EXPENSE		____
17	VETERINARY EXPENSE		____
18	CUSTOM WORK		____
19	TOTAL SUPPLEMENTAL COSTS	$____	____
20	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$____	____

* * *

21	SUPPLEMENTARY MANAGEMENT INFORMATION		
22	RETURN FOR $100 FEED FED	$____	
23	AVERAGE PRICE RECEIVED PER PIG SOLD	$____	
22	NUMBER OF PIGS PRODUCED	____	
25	NUMBER OF PIGS BORN PER LITTER	____	
26	NUMBER OF PIGS WEANED PER LITTER	____	
27	PER CENT DEATH LOSS	____	
28	PRICE PER CWT. CONCENTRATE FED	$____	
29	FEED AND SUPPL. COSTS PER PIG PRODUCED	$____	

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 12 - DAIRY COWS - 19 __ __

		HERD TOTAL	PER COW
1	AVERAGE NUMBER OF COWS	____	
2	POUNDS OF MILK		____
3	POUNDS OF BUTTERFAT		____
4	PER CENT OF BUTTERFAT IN MILK	____	
5	VALUE OF PRODUCE		
6	DAIRY PRODUCTS SOLD		____
7	DAIRY PRODUCTS USED IN HOME		____
8	MILK FED TO LIVESTOCK		____
9	NET INCREASES IN VALUE OF COWS		____
10	TOTAL VALUE PRODUCED	$____	____
11	POUNDS OF FEED FED		
12	CORN		____
13	SMALL GRAIN & COMPLETE DAIRY RATION		____
14	PROTEIN, SALT & MINERAL		____
15	TOTAL CONCENTRATES		____
16	LEGUME HAY		____
17	OTHER HAY AND DRY ROUGHAGE		____
18	SILAGE		____
19	$ FEED COSTS		
20	CONCENTRATES		____
21	ROUGHAGES		____
22	PASTURE		____
23	TOTAL FEED COSTS	$____	____
24	RETURN OVER FEED COST	$____	____
25	SUPPLEMENTAL COSTS		
26	MISCELLANEOUS LIVESTOCK EXPENSE		____
27	VETERINARY EXPENSE		____
28	CUSTOM WORK		____
29	TOTAL SUPPLEMENTAL COSTS	$____	____
30	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$____	____

* * *

31	SUPPLEMENTARY MANAGEMENT INFORMATION	$____	
32	RETURN FOR $100 FEED FED	$____	
33	FEED COST PER CWT. MILK	$____	
34	FEED COST PER POUNDS OF BUTTERFAT	$____	
35	GRAIN FED PER POUND OF MILK	____	
36	AVERAGE PRICE PER CWT. MILK SOLD	$____	
37	AVERAGE PRICE PER POUND OF BUTTERFAT	$____	

(Code No.) ------ (Cooperator's Name) ____ (Processing Date) ____

TABLE 13 - OTHER DAIRY CATTLE - 19 __ __

		HERD TOTAL	PER HEAD
1	NUMBER OF HEAD	$____	
2	NET INC. IN VALUE	____	____
3	POUNDS OF FEED FED		____
4	CONCENTRATES		____
5	HAY AND ROUGHAGE		____
6	SILAGE		____
7	MILK		____
8	FEED COST		
9	CONCENTRATES		____
10	ROUGHAGES		____
11	MILK		____
12	PASTURE		____
13	TOTAL FEED COSTS	$____	____
14	RETURN OVER FEED COST	$____	____
15	SUPPLEMENTAL COSTS		____
16	MISCELLANEOUS LIVESTOCK EXPENSE		____
17	VETERINARY EXPENSE		____
18	CUSTOM WORK		____
19	TOTAL SUPPLEMENTAL COSTS	$____	____
20	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$____	____

* * *

21	SUPPLEMENTARY MANAGEMENT INFORMATION		
22	RETURN FOR $100 FEED FED	$____	
23	PER CENT DEATH LOSS	$____	

(Code No.) ______ (Cooperator's Name) (Processing Date)

TABLE 14 - ALL DAIRY AND DUAL PURPOSE CATTLE - 19 __ __

		HERD TOTAL	PER COW
1	AVERAGE NUMBER OF COWS	_____	
2	VALUE OF DAIRY PRODUCTS	$_____	_____
3	NET INC. IN VALUE	$_____	_____
4	TOTAL VALUE PRODUCED	$_____	_____
5	POUNDS OF FEED FED		
6	CONCENTRATES		_____
7	HAY AND DRY ROUGHAGE		_____
8	SILAGE		_____
9	FEED COST		
10	CONCENTRATES		_____
11	ROUGHAGE		_____
12	PASTURE COSTS		_____
13	TOTAL FEED COSTS	$_____	_____
14	RETURN OVER FEED COSTS	$_____	_____
15	SUPPLEMENTAL COSTS		
16	MISCELLANEOUS LIVESTOCK EXPENSE		_____
17	VETERINARY EXPENSE		_____
18	CUSTOM WORK		_____
19	TOTAL SUPPLEMENTAL COSTS	$_____	_____
20	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$_____	_____

* * *

21	SUPPLEMENTARY MANAGEMENT INFORMATION		
22	RETURN FOR $100 FEED FED	$_____	

078

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 15A - BEEF BREEDING CATTLE - 19 __ __

		HERD TOTAL	PER COW
1	AVERAGE NUMBER OF BEEF COWS	______	
2	AVERAGE NUMBER OF OTHER BEEF ANIMALS AND BULLS	______	
3	POUNDS OF BEEF PRODUCED	______	
4	NET INCREASE IN VALUE	$______	______
5	POUNDS OF FEED FED		
6	GRAIN		______
7	PROTEIN, SALT AND MINERAL		______
8	LEGUME HAY		______
9	OTHER HAY AND DRY ROUGHAGE		______
10	SILAGE		______
11	FEED COST		
12	CONCENTRATES		______
13	ROUGHAGES		______
14	PASTURE		______
15	TOTAL FEED COSTS	$______	______
16	RETURN OVER FEED COST	$______	______
17	SUPPLEMENTAL COSTS		
18	MISCELLANEOUS LIVESTOCK EXPENSE		______
19	VETERINARY EXPENSE		______
20	CUSTOM WORK		______
21	TOTAL SUPPLEMENTAL COSTS	$______	______
22	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$______	______

* * *

23	SUPPLEMENTARY MANAGEMENT INFORMATION		
24	RETURN FOR $100 FEED FED	$______	
25	PRICE PER CWT. SOLD	$______	
26	AVERAGE WEIGHT PER HEAD SOLD	______	
27	PER CENT DEATH LOSS	______	
28	PER CENT CROP	______	

(Code No.) (Cooperator's Name) (Processing Date)

TABLE 15B - FEEDER CATTLE - 19 __ __

		HERD TOTAL	PER CWT.
1	AVERAGE NUMBER OF BEEF FEEDERS	____	
2	POUNDS OF BEEF PRODUCED	____	
3	NET INCREASE IN VALUE OF ANIMALS	$____	____
4	POUNDS OF FEED FED		
5	GRAIN		____
6	PROTEIN, SALE AND MINERAL		____
7	LEGUME HAY		____
8	OTHER HAY AND DRY ROUGHAGE		____
9	SILAGE		____
10	FEED COST		
11	CONCENTRATES		____
12	ROUGHAGES		____
13	PASTURE		____
14	TOTAL FEED COSTS	$____	____
15	RETURN OVER FEED COST	$____	____
16	SUPPLEMENTAL COSTS		
17	MISCELLANEOUS LIVESTOCK EXPENSE		____
18	VETERINARY EXPENSE		____
19	CUSTOM WORK		____
20	TOTAL SUPPLEMENTAL COSTS	$____	____
21	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$____	____

* * *

22	SUPPLEMENTARY MANAGEMENT INFORMATION	
23	RETURN FOR $100 FEED FED	$____
24	PRICE PER CWT. SOLD	$____
25	AVERAGE WEIGHT PER HEAD SOLD	____
26	PRICE PER CWT. BOUGHT	$____
27	AVERAGE WEIGHT PER HEAD BOUGHT	____
28	NUMBER OF HEAD BOUGHT	____
29	PER CENT DEATH LOSS	____

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 16A - SHEEP FLOCK - 19 __ __

		FLOCK TOTAL	PER EWE
1	AVERAGE NUMBER OF EWES	___	
2	POUNDS OF LAMB AND MUTTON PRODUCED	___	
3	POUNDS OF WOOL PRODUCED	___	
4	VALUE OF PRODUCE		
5	WOOL		___
6	NET INCREASE IN VALUE OF ANIMALS		___
7	TOTAL VALUE PRODUCED	$___	___
8	POUNDS OF FEED FED		
9	GRAIN		___
10	PROTEIN, SALT AND MINERAL		___
11	LEGUME HAY		___
12	OTHER HAY AND DRY ROUGHAGE		___
13	SILAGE		___
14	FEED COST		
15	CONCENTRATES		___
16	ROUGHAGES		___
17	PASTURE		___
18	TOTAL FEED COST	$___	
19	RETURN OVER FEED COST	$___	___
20	SUPPLEMENTAL COSTS		
21	MISCELLANEOUS LIVESTOCK EXPENSE		___
22	VETERINARY EXPENSE		___
23	CUSTOM WORK		___
24	TOTAL SUPPLEMENTAL COSTS	$___	___
25	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$___	___

* * *

26	SUPPLEMENTARY MANAGEMENT INFORMATION		
27	RETURN FOR $100 FEED FED	$___	
28	PRICE PER CWT. LAMB AND MUTTON SOLD	$___	
29	POUNDS OF WOOL PER SHEEP SHEARED	___	
30	NUMBER OF EWES KEPT FOR LAMBING	___	
31	PER CENT LAMB CHOP	___	
32	PER CENT DEATH LOSS	___	

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 16B - FEEDER LAMBS - 19 __ __

		FLOCK TOTAL	PER CWT.
1	AVERAGE NUMBER OF LAMBS	______	
2	POUNDS OF LAMB PRODUCED	______	
3	POUNDS OF WOOD PRODUCED	______	
4	VALUE OF PRODUCE		
5	WOOL		______
6	NET INCREASE IN VALUE		______
7	TOTAL VALUE PRODUCED	$______	______
8	POUNDS OF FEED FED		
9	GRAIN		______
10	PROTEIN, SALT AND MINERAL		______
11	LEGUME HAY		______
12	OTHER HAY AND DRY CONCENTRATE		______
13	SILAGE		______
14	FEED COST		
15	CONCENTRATES		______
16	ROUGHAGES		______
17	PASTURE		______
18	TOTAL FEED COSTS	$______	______
19	RETURN OVER FEED COST	$______	______
20	SUPPLEMENTAL COST		
21	MISCELLANEOUS LIVESTOCK EXPENSE		______
22	VETERINARY EXPENSE		______
23	CUSTOM WORK		______
24	TOTAL SUPPLEMENTAL COSTS	$______	______
25	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$______	______

* * *

26	SUPPLEMENTARY MANAGEMENT INFORMATION		
27	RETURN FOR $100 FEED FED	$______	
28	PRICE PER CWT. SOLD	$______	
29	POUNDS OF WOOL PER SHEEP SHEARED	______	
30	AVERAGE WEIGHT OF LAMBS SOLD	______	
31	PRICE PER CWT. BOUGHT	$______	
32	AVERAGE WEIGHT OF LAMBS BOUGHT	______	
33	PER CENT DEATH LOSS	______	

------ (Code No.) ______ (Cooperator's Name) ______ (Processing Date)

TABLE 17A - LAYING FLOCK - CHICKENS - 19 __ __

		FLOCK TOTAL	PER HEN
1	AVERAGE NUMBER OF HENS	___	
2	VALUE OF PRODUCE		
3	EGGS SOLD AND USED		___
4	INC. IN VALUE OF FLOCK		___
5	TOTAL VALUE PRODUCED	$___	___
6	POUNDS OF FEED FED		
7	GRAIN		___
8	PROTEIN, SALT AND MINERAL		___
9	COMPLETE COMMERCIAL FEED		___
10	TOTAL POUNDS OF FEED		___
11	TOTAL FEED COST	___	___
12	RETURN OVER FEED COST	$___	___
13	SUPPLEMENTAL COSTS	$___	___
14	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$___	___

* * *

15	SUPPLEMENTARY MANAGEMENT INFORMATION	
16	RETURN FOR $100 FEED FED	$___
17	EGGS LAID PER HEN	___
18	PRICE PER DOZEN EGGS SOLD - CENTS	$___
19	FEED COST PER DOZEN EGGS - CENTS	$___
20	RETURN OVER FEED COSTS PER DOZEN EGGS - CENTS	$___
21	PER CENT DEATH LOSS	___

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 17B - BROILERS - 19 __ __

		FLOCK TOTAL	PER CWTS.
1	CWT. OF BROILERS PRODUCED	____	
2	NET INCREASE IN VALUE	$____	____
3	POUNDS OF FEED FED		
4	GRAIN		____
5	PROTEIN		____
6	COMPLETE COMMERCIAL FEED		____
7	TOTAL POUNDS OF FEED		____
8	TOTAL FEED COST	$____	____
9	RETURN OVER FEED COST	$____	____
10	SUPPLEMENTAL COSTS	$____	____
11	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$____	____

* * *

12	SUPPLEMENTARY MANAGEMENT INFORMATION	
13	RETURN FOR $100 FEED FED	$____
14	NUMBER OF BIRDS PURCHASED	____
15	PRICE PAID PER BIRD PURCHASED - CENTS	____
16	PER CENT DEATH LOSS	____
17	PRICE PER CWT. OF FEED	$____
18	PRICE RECEIVED PER POUNDS OF BROILERS SOLD-CENTS	
19	WEIGHT PER BIRD SOLD IN POUNDS	____

(Code No.) ------ (Cooperator's Name ______ (Processing Date) ______

TABLE 18A - LAYING FLOCK - TURKEYS - 19 __ __

		FLOCK TOTAL	PER HEN
1	AVERAGE NUMBER OF HENS	____	
2	VALUE OF PRODUCE		
3	EGGS SOLD AND USED		____
4	INC. IN VALUE OF FLOCK		____
5	TOTAL VALUE PRODUCED	$____	____
6	POUNDS OF FEED FED		____
7	GRAIN		____
8	PROTEIN, SALT AND MINERAL		____
9	COMPLETE COMMERCIAL FEED		____
10	TOTAL POUNDS OF FEED		____
11	TOTAL FEED COST		____
12	RETURN OVER FEED COST	$____	____
13	SUPPLEMENTAL COSTS	$____	____
14	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$____	____

* * *

15	SUPPLEMENTARY MANAGEMENT INFORMATION	
16	RETURN FOR $100 FEED FED	$____
17	EGGS LAID PER HEN	____
18	PRICE PER EGG SOLD - CENTS	$____
19	FEED COST PER EGG SOLD - CENTS	$____
20	RETURN OVER FEED COSTS PER EGG	$____
21	PER CENT DEATH LOSS	____

(Code No.) ______ (Cooperator's Name) ______ (Processing Date) ______

TABLE 18B - TURKEY POULTS - 19__

		FLOCK TOTAL	PER CWT.
1	CWT. NO TURKEYS PRODUCED	______	
2	NET INCREASE IN VALUE	$______	______
3	POUNDS OF FEED FED		
4	GRAIN		______
5	PROTEIN, SALT AND MINERAL		______
6	COMPLETE COMMERCIAL FEED		______
7	TOTAL POUNDS OF FEED		______
8	TOTAL FEED COSTS	$______	______
9	RETURN OVER FEED COST	$______	______
10	SUPPLEMENTAL COSTS	$______	______
11	RETURN OVER FEED AND SUPPLEMENTAL COSTS	$______	______

* * *

12	SUPPLEMENTARY MANAGEMENT INFORMATION		
13	RETURN FOR $100 FEED FED	$______	
14	NUMBER OF POULTS PURCHASED	______	
15	PRICE PAID PER POULT PURCHASED	______	
16	PER CENT DEATH LOSS	______	
17	PRICE PER CWT. OF FEED	$______	
18	PRICE RECEIVED PER POUNDS OF TURKEYS SOLD	$______	
19	WEIGHT PER BIRD SOLD IN POUNDS	______	

Gathering Data for Analysis

A vehicle was necessary to conveniently collect all of the data necessary to complete a business analysis. The staff developed four computer data forms which had space to record all of the information necessary for a complete business analysis using the revised printout format. While the forms were designed to be used with the Minnesota Farm Account Book, it is important to note that any record book which can supply the information needed can be used as a source of data.

The data forms were produced in 11" x 17" size to provide adequate writing space. The final revision of the four forms in use in Minnesota are shown on the pages which follow. Each line was numbered to permit easy reference. The last digit of each line number designates the first half (xx1) or last half (xx2) of the page and should be ignored when using the documentation which follows.

COMPUTER DATA SHEET
FORM 1
REVISED SEPT. 1967

MINNESOTA VO-AG FARM BUSINESS
MANAGEMENT EDUCATION PROGRAM

INVENTORY DATA

CODE _ _ _ _ _ _ NAME ____________
DATE ________ SCHOOL ____________
CITY ________ STATE ________

LINE	DESCRIPTION	PAGE	BEGINNING INVENTORY				ENDING INVENTORY				TRANSFERS IN		TRANSFERS OUT		LINE	BUTCHERED			SALES			PURCHASES		
			QUANT.	WHOLE FARM	OPER. SHARE	L.L. SHARE	QUANT.	WHOLE FARM	OPER. SHARE	L.L. SHARE	QUANT	WHOLE FARM	QUANT.	WHOLE FARM		QUANT	WHOLE FARM	L.L. SHARE	QUANT	WHOLE FARM	L.L. SHARE	QUANT	WHOLE FARM	L.L. SHARE
11	DAIRY & DUAL PURPOSE COWS	4-7													12									
21	OTHER DAIRY CATTLE	8-9													22									
31	BEEF-BREEDING CATTLE	10-11													32									
41	BEEF-FEEDER CATTLE	12-13													42									
51	HOGS-COMPLETE	16-17													52									
61	HOGS-FINISHING	12-15													62									
71	HOGS-WEANING PIGS	16-17													72									
81	SHEEP-FARM FLOCK	18-19													82									
91	SHEEP-FEEDER LAMBS	12-15													92									
101	CHICKENS-LAYING HENS	20-21													102									
111	CHICKENS-BROILERS	12-15													112									
121	TURKEYS-LAYING FLOCK	20-21													122				•					
131	TURKEYS-POULTS	12-15													132				•					
141	OTHER PRODUCTIVE LVSTK.	23													142									
151	CROP,SEED &FEED	30-31																						
161	AUTO & TRUCK-FARM SHARE	D																						
171	POWER CROP GEN.MACH.	D																						
181	LIVESTOCK EQUIPMENT	D																						
191	BARE LAND	D																						
201	BLDGS., FENCES& TILING	D																						
211	TOTAL NON-FARM ASSETS	53																						
221	DWELLING	D																						
231	REAL ESTATE MORTGAGES	52																						
241	CHATTEL AND CROP LOANS	52																						
251	NOTES	52																						
261	ACCOUNTS PAYABLE	52																						

• REPORT TO NEAREST 10LBS.

LINE	DESCRIPTION	QUANT.	VALUE		
			WHOLE FARM	OPER. SHARE	L.L. SHARE
271	WHOLE MILK USED IN HOUSE	QTS.			
281	SKIM MILK USED IN HOUSE	QTS.			
291	CREAM USED IN HOUSE	QTS.			
301	CREAM SOLD	BF			
311	WHOLE MILK SOLD	LBS.			
321	BUTTERFAT IN MILK SOLD	LBS.			
331	SHEEP-FMFL NO. SHEARED	NO.			
341	SHEEP-FMFL WOOL SOLD	LBS			
351	SHEEP-FMFL INCENT. PYT.				
332	SHEEP-FDLAMB NO. SHEARED	NO.			
342	SHEEP-FDLAMB WOOL SOLD	LBS.			
352	SHEEP-FDLAMB INCENT. PYT.				
361	CHICKEN EGGS SOLD	DOZ.			
371	TURKEY EGGS SOLD	DOZ.			
381	EGGS USED IN HOUSE	DOZ.			
391	CROPS USED IN HOUSE				

LINE	DESCRIPTION	NUMBER BEG. INVENT.	NUMBER PURCH.	NUMBER TRANS. IN	NUMBER BORN	NUMBER SOLD	NUMBER YOUNG DIED	NUMBER OLD DIED	NUMBER TRANS. OUT	NUMBER BUTCH.	NUMBER ENDING INVENT.	LINE	FEMALES BEARING YOUNG	AVERAGE NUMBER ADULTS	AVERAGE NUMBER OTHER	MISCELL LVSTK EXPENSE	VETER. EXPENS	CUSTOM WORK HIRED	BLDGS. AND EQUIP.	POWER AND ELECT.	INVEST-MENT
401	DAIRY & DUAL PURPOSE COWS											402		•							
411	OTHER DAIRY CATTLE											412		•	•						
421	BEEF BREEDING CATTLE											422		•	•						
431	BEEF-FEEDER CATTLE											432		•	•						
441	HOGS-COMPLETE											442		•	•						
451	HOGS-FINISHING											452		•	•						
461	HOGS-WEANING PIGS											462		•	•						
471	SHEEP-FARM FLOCK											472		•	•						
481	SHEEP-FEEDER LAMBS											482		•	•						
491	CHICKENS-LAYING HENS											492		•	•						
501	CHICKENS-BROILERS											502		•	•						
511	TURKEYS-LAYING FLOCK											512		•	•						
521	TURKEYS-POULTS											522		•	•						
531	OTHER PRODUCTIVE LVSTK.											532		•	•						

*REPORT AVERAGE NO. TO NEAREST .1

Exhibit B - Computer Data Forms

COMPUTER DATA SHEET
FORM 2
REVISED SEPT. 1967

MINNESOTA VO-AG FARM BUSINESS
MANAGEMENT EDUCATION PROGRAM

INCOME AND EXPENSE DATA

CODE _ _ _ _ _ _ NAME ____________________
DATE ____________ SCHOOL ____________________
CITY ____________ STATE ____________________

LINE		PAGE	WHOLE FARM	OPERATOR'S SHARE	LANDLORD'S SHARE	HOUSEHOLD & PERS. EXP.
11	VETERINARY EXPENSE	24-25				
21	MISCELLANEOUS LIVESTOCK EXPENSE	24-25				
31	FEED BOUGHT	32-36				
41	FERTILIZERS	38				
51	CROP CHEMICALS	38				
61	OTHER CROP EXPENSES	39				
71	CUSTOM WORK HIRED:					
81	FOR TRUCK SHARE	40				
91	FOR POWER AND CROP MACHINERY	40				
101	FOR LIVESTOCK EQUIPMENT SHARE	40				
111	LABOR SHARE	40				
121	REPAIR OF LIVESTOCK EQUIPMENT	41				
131	REPAIR OF REAL ESTATE	41				
141	TRUCK AND AUTO BOUGHT	42-43				
151	POWER AND CROP MACHINERY BOUGHT	42-43				
161	LIVESTOCK EQUIPMENT BOUGHT	42-43				
171	BUILDINGS AND FENCES BOUGHT	42-43				
181	LAND BOUGHT	42-43				
191	DWELLING BOUGHT	42-43				
201	TRUCK AND AUTO SOLD	43				
211	POWER AND CROP MACHINERY SOLD	43				
221	LIVESTOCK EQUIPMENT SOLD	43				
231	BUILDINGS AND FENCES SOLD	43				
241	LAND SOLD	43				
251	DWELLING SOLD	43				
261	GAS TAX REFUND	44				
271	GAS, OIL, GREASE BOUGHT-TOTAL	44-45				
281	FOR TRACTOR AND CROP MACHINERY	44-45				
291	FOR TRUCK	44-45				
301	FOR AUTO	44-45				
311	REPAIR&OPERATION OF POWER & MACH. :TOTAL	46-47				
321	FOR TRACTOR & CROP MACHINERY	46-47				
331	FOR TRUCK	46-47				
341	FOR AUTO	46-47				
351	WAGES FOR HIRED LABOR	48-49				
361	PROPERTY TAXES	49				
371	CASH RENT EXPENSE	49				
381	GENERAL FARM EXPENSE	50				
391	TELEPHONE EXPENSE	50				
401	ELECTRICITY EXPENSE	50				
411	INCOME FROM WORK OFF THE FARM:					
421	FOR TRUCK	51				
431	FOR POWER & CROP MACHINERY	51				
441	FOR LIVESTOCK EQUIPMENT	51				
451	LABOR SHARE	51				
461	CO-OP PATRONAGE REFUNDS	51				
471	MISCELLANEOUS FARM INCOME	51				

LINE		PAGE	RECORD TOTALS
481	MONEY BORROWED	52	
491	PAID ON DEBTS-PRINCIPAL	52	
501	-INTEREST	52	
511	INVESTMENTS MADE	53	
521	INCOME FROM INVESTMENTS	53	
531	OTHER NON-FARM INCOME	54	
541	INCOME AND SELF-EMPLOYMENT TAXES	54	
551	INCOME TAX REFUNDS	54	
561	CONTRIBUTIONS TO CHURCH AND WELFARE	55	
571	MEDICAL EXPENSES	55	
581	FOOD AND MEALS BOUGHT	56-57	
591	OPERATING EXPENSES AND SUPPLIES	57	
601	FURNISHINGS AND EQUIPMENT	57	
611	CLOTHING	58	
621	PERSONAL CARE AND SPENDING	58	
631	EDUCATION	59	
641	RECREATION	59	
651	GIFTS AND SPECIAL EVENTS	59	
661	NUMBER OF PERSONS IN FAMILY		
671	ADULT EQUIVALENT IN FAMILY (TO NEAREST 1/10)		.
681	DAYS OF DAY LABOR HIRED		
691	MONTHS OF MONTHLY LABOR HIRED (TO NEAREST 1/10)		.
701	HIRED LABOR BOARDED -OPERATOR		$
711	-PARTNERS		$
721	DAYS OF UNPAID FAMILY LABOR		
731	VALUE OF UNPAID FAMILY LABOR		$
741	NUMBER OF OPERATORS ON THE FARM		
751	MONTHS WORKED BY OPERATOR (TO NEAREST 1/10)		.
761	MONTHS WORKED BY PARTNERS (TO NEAREST 1/10)		.
771	VALUE OF PARTNER'S LABOR		$
781	OWNER 1; RENTER 2; PARTNER 3 (CHECK)		1 ☐ 2 ☐ 3 ☐
791	NET WORTH STATEMENT (CHECK YES OR NO)		YES ☐ NO ☐

NOTES

COMPUTING ADULT EQUIVALENT

LINE	MEMBERS OF THE FAMILY	PER PERSON	NO. OF PERSONS	ADULT EQUIV.
801	CHILD UNDER 7YEARS	.4		
811	CHILD FROM 7 TO 12 YEARS	.6		
821	WOMEN 13YEARS AND OLDER	.8		
831	BOYS FROM 13 TO 18 YEARS	.9		
841	MEN 19 YEARS AND OLDER	1.0		
851	TOTAL			

COMPUTER DATA SHEET
FORM 1
REVISED SEPT. 1967

MINNESOTA VO-AG FARM BUSINESS
MANAGEMENT EDUCATION PROGRAM

CROP DATA

CODE — — — — — — NAME ____________
DATE ____________ SCHOOL ____________
CITY ____________ STATE ____________

LINE		CROP RANK	VALUE PER PRODUCTION UNIT	OWNED		RENTED		CROP SALES			LINE	ALLOCATED CROP EXPENSES							
				ACRES TO 1/10	PRODUCTION (TOTAL)	ACRES TO 1/10	PRODUCTION (TOTAL)	WHOLE FARM	OPERATORS SHARE	LANDLORD'S SHARE		FERTILIZER	CHEMICALS	SEED AND OTHER	SPEC. HIRED LABOR	CUSTOM WORK	POWER & MACH.	LAND COST	MISC. COSTS
11	FLAX		. BU.	.	BU.	.	BU.				12								
21	BARLEY		. BU.	.	BU.	.	BU.				22								
31	WHEAT		. BU.	.	BU.	.	BU.				32								
41	OATS AND OAT MIXTURES--GR.		. BU.	.	BU.	.	BU.				42								
51	RYE		. BU.	.	BU.	.	BU.				52								
61	CANNING PEAS		$1.00	.	$	.	$				62								
71	POTATOES		. CWT	.	CWT	.	CWT				72								
81	SUGAR BEETS		. TON	.	TON	.	TON				82								
91	OTHER CULTIVATED CROPS - A		$1.00	.	$	.	$				92								
101	OTHER CULTIVATED CROPS - B		$1.00	.	$	.	$				102								
111	SUNFLOWERS		. CWT	.	CWT	.	CWT				112								
121	OAT SILAGE		. TON	.	TON	.	TON				122								
131	CANNING CORN		$1.00	.	$	.	$				132								
141	CORN FOR GRAIN		. BU.	.	BU.	.	BU.				142								
151	HYBRID SEED CORN		. BU.	.	BU.	.	BU.				152								
161	SOYBEANS		. BU.	.	BU.	.	BU.				162								
171	CORN AND CANE SILAGE		. TON	.	. TON	.	TON				172								
181	CORN AND CANE FODDER		. TON	.	TON	.	TON				182								
191	ALFALFA HAY		. TON	.	TON	.	TON				192								
201	OTHER LEGUME HAY AND MIXT.		. TON	.	TON	.	TON				202								
211	TAME GRASS HAY		. TON	.	TON	.	TON				212								
221	ANNUAL HAY		. TON	.	TON	.	TON				222								
231	LEGUME AND GRASS SILAGE		. TON	.	TON	.	TON				232								
241	LEGUME SEED		. LBS.	.	LBS	.	LBS				242								
251	GRASS SEED		. LBS	.	LBS	.	LBS				252								
261	ALFALFA AND MIXED PASTURE		. ---	.	---	.	---				262								
271	OTHER LEGUME PASTURE		. ---	.	---	.	---				272								
281	OTHER TILLABLE PASTURE		. ---	.	---	.	---				282								
291	DIVERTED ACRES		$1.00	.	$	.	$				292								
301	SUMMER FALLOW ---TILLED		. ---	.	---	.	---				302								
311	OTHER TILLABLE LAND IDLE		. ---	.	---	.	---				312								
321	WILD HAY			.	TON	.	TON												
331	NON-TILLABLE PASTURE			.		.													
341	TIMBER			.	$	.	$												
351	ROADS AND WASTE			.		.													
361	FARMSTEAD			.		.													

COMPUTER DATA SHEET
FORM 4
REVISED SEPT. 1967

FEED DATA

CODE ________ NAME ________
DATE ________ SCHOOL ________
CITY ________ STATE ________

LINE		CORN-56#		OATS-32#		BARLEY,MILLET BUCKWHEAT-48#		RYE,FLAX-56#		LINE	WHEAT,SOYBEANS DRY PEAS-60#		PROTEIN, SALT MINERAL		COMPLETE RATIONS		LEGUME HAY	
		BUSHELS	VALUE	BUSHELS	VALUE	BUSHELS	VALUE	BUSHELS	VALUE		BUSHELS	VALUE	CWT.	VALUE	TONS	VALUE	TONS	VALUE
11	DAIRY OR DUAL PURPOSE COWS									12			.		.		.	
21	OTHER DAIRY CATTLE									22			.		.		.	
31	BEEF BREEDING CATTLE									32			.		.		.	
41	BEEF FEEDER CATTLE									42			.		.		.	
51	HOGS-COMPLETE ENTERPRISE									52			.		.		.	
61	HOGS-FINISHING									62			.		.		.	
71	HOGS-PRODUCING WEANING PIGS									72			.		.		.	
81	SHEEP FARM FLOCK									82			.		.		.	
91	SHEEP FEEDERS									92			.		.		.	
101	CHICKENS-LAYING HENS									102			.		.			
111	CHICKENS-BROILERS									112			.		.			
121	TURKEYS-LAYING FLOCK									122			.		.			
131	TURKEYS-POULTS									132			.		.			
141	OTHER PRODUCTIVE LIVESTOCK									142			.		.		.	

LINE		OTHER HAY		CORN SILAGE		GRASS SILAGE		FODDER AND STOVER		LINE	PASTURE		WHOLE MILK FED		FARM PRODUCED SKIM MILK FED			
		TONS	VALUE	TONS	VALUE	TONS	VALUE	TONS	VALUE		DAYS	VALUE	LBS.	VALUE	LBS.	VALUE		
151	DAIRY OR DUAL PURPOSE COWS	.		.		.		.		152	.							
161	OTHER DAIRY CATTLE	.		.		.		.		162								
171	BEEF BREEDING CATTLE	.		.		.		.		172								
181	BEEF FEEDER CATTLE	.		.		.		.		182								
191	HOGS-COMPLETE ENTERPRISE	.		.		.				192								
201	HOGS-FINISHING	.		.		.				202								
211	HOGS-PRODUCING WEANING PIGS	.		.		.				212								
221	SHEEP FARM FLOCK	.		.		.		.		222								
231	SHEEP FEEDERS	.		.		.		.		232								
241	OTHER PRODUCTIVE LIVESTOCK	.		.		.		.		242								

INSTRUCTIONS FOR RECORDING FARM BUSINESS DATA

Because the correct completion of the data sheets was an absolute prerequisite to an accurate business analysis, a set of instructions was prepared to aid coordinators and teachers in using the four data forms properly. Information for completing the data sheets comes from several sources; the account book, crop and feed check, livestock report and supplementary information form. The instructions direct the user in the proper recording of data from each source. The instructions are written assuming that the recorder has a general knowledge of the way in which the data is to be used in the business analysis and has competence in closing an account book for analysis purposes.

INSTRUCTIONS FOR COMPLETING COMPUTER DATA FORMS FOR MINNESOTA VOCATIONAL AGRICULTURE FARM BUSINESS MANAGEMENT PROGRAM

The instructions are to clarify the procedures for recording data from the completed Minnesota Farm Account Book. Uniform procedures among analysis areas will permit farm records to be used in special sorts without regard to analysis area boundaries and provide a variety of teaching materials for use in high school and adult agricultural instruction.

Recorders should consider each item carefully before placing the information on the data sheet. Directions for recording quantities and values must be observed very carefully to avoid costly errors in the final analysis report. The design of the computer forms aids in direct transfer of data from the account book. Livestock numbers and feed quantities can be transferred directly from the appropriate close-out forms (i.e., livestock report; crop and feed check). Every effort has been made to eliminate the necessity for calculating quantities and values prior to entry on the computer forms.

INVENTORY DATA - FORM 1

Code - Assign each cooperator a unique code:

Area School	Cooperating School	Cooperator Number
_ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _
_ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _	_ _ _ _ _ _ _ _ _ _

Area schools should use the following codes:

Code		Code	
1	Austin	6	St. Cloud
2	Winona	7	Willmar
3	Mankato	8	Jackson
4	Thief River Falls	9	Not assigned
5	Duluth	10	Not assigned

The code for an individual farm should remain the same from year to year to permit easy data retrieval.

Name - Print full name.

Date - Record date the data sheet is completed. Some may prefer to use the date the sheets are submitted to the Computer Center.

School - School in which cooperator is enrolled in farm business management education.

City - City address of school.

State - Minnesota (to differentiate from Washington, Wisconsin, Iowa, and others who use the same program for record analysis.)

Special Instructions

The information described above should be clearly printed on each data form. Forms are separated at the Computer Center before being key punched and later are reassembled.

Unless specifically noted, all values should be in whole numbers or whole dollar amounts.

Figures that appear in any of the shaded areas will be ignored by by the Computer Center.

The way each item is used in the analysis report may be determined by consulting "Documentation for Farm Business Record Analysis." Page numbers in the instructions refer to pages in the Third Edition, Minnesota Farm Account Book.

INSTRUCTIONS - DATA FORM 1

Line	
Line 11, 12	Record data from dairy and dual purpose cows from Pages 4-7. Record quantity butchered in pounds.
Line 21, 22	Other dairy includes other dual purpose cattle. Transfers-out include both heifers freshened and transferred to feeders. Transfers-in may occur but need to be designated in the account book as transfers-in since the account book makes no provision for such transfer.
Line 31, 32	Record all quantities in pounds.
Line 41, 42	Record transfers-in and transfers-out carefully. All quantities should be recorded in pounds.

Line 51, 52	Hogs-Complete should include those operations which breed, farrow, and market pigs for slaughter or produce mature breeding stock for sale. Coordinators must decide the category in which other types of mixed-swine operations should be recorded.
Line 61, 62	Only those swine enterprises in which feeder pigs are purchased and fattened for slaughter should be recorded here. All quantities should be reported in pounds.
Line 71, 72	Swine herds which produce weaning pigs for sale to persons with hog-finishing operations are recorded in this section. All quantities should be recorded in pounds. Transfers may occur between and among all hog enterprises. Total transfers-in must equal total transfers-out.
Line 81, 82	Quantity in pounds - Transfers may be made to and from feeder lambs. Do not record wool sold and incentive payment as part of Sales. Record these items in Lines 341 and 351.
Line 91, 92	Transfers may be made to and from farm flock. Do not record wool sold or incentive payment as part of Sales. Record these items on Lines 342 and 352.
Line 101, 102	Record quantity in pounds for chickens butchered. Laying hens may not be transferred out, but hens may be transferred in if pullet flock has been recorded as broilers to keep the pullet production enterprise separate.
Line 111, 112	Record quantity in pounds. Birds may be transferred out but not in. If pullet flock is recorded as broilers, the enterprise should be kept out of the averages for broilers.
Line 121, 122	Record all quantities in pounds - IMPORTANT. Record quantities sold to nearest 10 pounds. A sale of 129,420 pounds of turkey would be recorded as 12,942. Turkey hens may be transferred into the turkey laying flock from the turkey poult flock.
Line 131, 132	IMPORTANT: Quantity of sales should be reported to the nearest ten pounds. A sale of 129,429 pounds would be recorded as 12,943. Turkey poults may be transferred to the turkey laying flock.
Line 141, 142	All forms of other livestock should be recorded here. Horses, bees, mink, ducks, geese, and other enterprises may be appropriately entered.
Line 151-261	Should be transferred directly from the appropriate pages. Liability items should be grouped as carefully as possible into the four liability categories.

Line 271	Whole milk used in the house must be recorded in quarts.
Line 281	Skim milk must be identified from Page 2, Column 2, and recorded in quarts.
Line 291	Cream used is recorded in quarts. NOTE: M.F.A.B. records cream in pints (Pints ÷ 2 = Quarts).
Line 301	Record only pounds of butterfat and value. The computer program will compute the whole milk equivalent for deriving whole milk produced. Do not record total pounds of cream sold.
Line 311	Record pounds of milk sold and value of whole milk sold.
Line 321	Butterfat contained in whole milk sold.
Line 331	Record from total, Column 15, Page 18 (M.F.A.B.), total number of sheep sheared.
Line 341	Both pounds of wool sold and value of wool must be recorded.
Line 351	Value of incentive payment from Page 19 (M.F.A.B.) should be recorded here.
Line 332	The number of feeder lambs sheared may need to be calculated from information recorded on the feeder lamb pages.
Line 342	Wool Sold should be calculated from information recorded on the feeder lamb pages.
Line 352	Incentive Payment should be calculated from information recorded in the feeder lamb pages. Feeder lamb operators may choose not to report any information for lines 332-352.
Line 361	Record eggs sold in dozens.
Line 371	Record eggs sold in dozens.
Line 381	Eggs used in house may be either turkey or chicken eggs. If the farm record shows only chicken eggs sold, eggs used in the house will be credited to chickens. If the record reports only turkey eggs sold, the eggs used in house will be credited to the turkey laying flock. In the event both chickens and turkeys are raised on the same farm, eggs used in house will be credited to chickens. If eggs are used by hired labor, the number of dozens and value should be added to the eggs sold. A like value should be added to wages of hired labor.
Line 391	Enter value of crops and produce used in house. May include all vegetables and fruits and other products such as honey.
Line 401	Numbers should come directly from the monthly livestock account in the record book or from the Livestock Report F.A.12.

Line 402 Females bearing young is the number of cows calving. Average number of adults equals the sum of January-December first of month inventory of dairy cows plus December 31 inventory divided by 13.

Values for miscellaneous livestock expense and veterinary expense come from Pages 24-25, M.F.A.B. Custom work hired is the sum of items for dairy cows from Page 40. DO NOT record values for buildings and equipment, power and electricity, and investment. These columns appear in anticipation of future changes in the analysis process for livestock enterprises. This instruction applies to all livestock enterprises. NOTE: Average number of adults and Average number of others are recorded to the nearest 1/10 animal.

Line 411 Record directly from Livestock Report F.A.12 or monthly account book inventory record.

Line 412 There can be no females bearing young - Average number of adults should include herd sires. All remaining other dairy are reported as average number of other.

Line 421 From Livestock Report F.A.12 or account book.

Line 422 Females bearing young - Not used in current computer analysis for beef cattle but space is provided on Table 15A to manually record per cent calf crop. If per cent calf crop is to be calculated, this column should record the number of head that should have born young during the year. (Number born ÷ Females bearing young) x 100 equals per cent calf crop. This item may computed manually and recorded in the blank provided in Line 28, Table 15A of the analysis printout. Average number of adults is cows only. Bulls and others are recorded as average number other.

Line 431 From Livestock Report F.A.12 or account book.

Line 432 Animals kept for feeders should be recorded as average number other, regardless of age.

Line 441 From Livestock Report F.A.12 or account book.

Line 442 Number of litters farrowed reported under Females bearing young. Average number of adults includes all hogs over six months of age. All others reported under Average number other.

Line 451 From Livestock Report F.A112 or account book.

Line 452 All fattening stock should be reported under Average number other, regardless of age. If some mature breeding stock is maintained, they should be recorded as Average number adults. All litters farrowed should be reported as females bearing young.

Line 461 From Livestock Report F.A.12 or account book.

Line 462	Number of litters farrowed recorded as Number of females bearing young. Average numbers of animals recorded as indicated. Swine in breeding herd (generally 6 months of age or more) are recorded as adults.
Line 471	From Livestock Report F.A. 12 or account book.
Line 472	Females bearing young should be the number of ewes kept for lambing. Average number of adults includes ewes only. Rams and lambs reported as Average number other.
Line 481	From Livestock Report.
Line 482	All feeder lambs should be reported as other regardless of age. Mature breeding stock and ewes kept for lambing should be entered as indicated.
Line 491	From Livestock Report F.A.12 or account book.
Line 492	Average number of adults includes hens only. Growing pullets and male birds should be recorded as other.
Line 501	From Livestock Report F.A.12 or account book.
Line 502	Record all birds raised for slaughter as other.
Line 511	From Livestock Report F.A.12.
Line 512	Average Number of Adults includes hens only. Growing poults and toms should be recorded as other.
Line 521	From Livestock Report F.A.12 or account book.
Line 522	Record all birds raised for slaughter as other.
Line 531, 532	It is not necessary at this time to complete these lines.

COMPUTER DATA - FORM 2

All items on this page are recorded as whole numbers except lines 671, 691, 751, and 761. Marks or numbers which appear in the shaded areas will be ignored at the Computer Center. Any notes which appear in the margins will also be ignored at the Computer Center.

Whole Farm Values are equal to Operators Farm Share + Landlords Share + Household and personal expense. The amounts shown in this column are those recorded in the Minnesota Farm Account book in the Total Value column before deductions are made for the household share.

Line

Line 11, 21	These items must be recorded even though they have previously been reported on Form One (1) for individual enterprises.

Line 31	Report directly from account.
Line 41, 51, 61	These items must be reported even though they will be reported on Form Three (3) for individual crops.
Line 71, 81, 91, 101, 111	Custom work hired should be assigned to the appropriate category prior to recording. The following scheme may be used to divide the total cost of custom work among the appropriate categories.

ALLOCATION OF CUSTOM WORK AND WORK OFF THE FARM TO POWER, MACHINERY, AND LABOR

Item	Category Number	Truck Share	Power & Machinery Share	Labor Share	Livestock Equipment Share
Trucking	1	60%		40%	
Tractor Work			60%	40%	
Planting, plowing, spraying, cultivating, silo filling, loading manure, snow plowing, combination of one or more headings	2		70%	30%	
Combining, corn picking, baling, swathing, field chopping, grinding	3		75%	25%	
Corn Shelling	4		70%	30%	
Bulldozing	5		80%	20%	
Corn Drying	6		80%	20%	
Sheep Shearing, etc.	7			80%	20%
Welding	8		50%	50%	

Line 121-401	Report as indicated. Pay particular attention to the household and personal share. It is important that all items be properly recorded.
Line 411, 421, 431, 441, 451	Income from work off the farm should be allocated to the proper category using the same as suggested for custom work hired.
Line 461-651	Report directly from account.
Line 661	Calculate from supplementary information sheet, F.A.51.
Line 671	Calculation of adult equivalent is done in Lines 801-851.
Line 681	Report days of day labor hired.

Line 691	Report months of monthly labor hired.
Line 701	Report directly from account book.
Line 711	Report directly from account book.
Line 721	Report directly from account book.
Line 731	Value of unpaid family labor per day should be fairly uniform within an analysis area. Report from account book.
Line 741	Number of operators on farm includes operator and all other partners or operators.
Line 751	Report actual months available for work (usually 12 but may be less).
Line 761	Report months worked by other operators listed as part of Line 741.
Line 771	An estimate must be made of the value of other partners' or operators' labor. Report a uniform value per month within an analysis area for each month reported worked by other operators or partners (Line 761).
Line 781	Check the appropriate tenure arrangement. Check all that apply. Do not write in the shaded numbers; record answer in column titled Record Totals.
Line 791	Check Yes if a net worth statement should be reported for the farm, No if information is insufficient to compile a reasonable net worth statement.

CROP DATA - FORM 3

Directions for Form 3 are given by columns:

Crop Rank - Record rank A, B, C, D, for each crop reported according to scheme devised for each analysis area.

Value per Production Unit - Report to nearest cent. Value must be complete, six dollars must be written 6.00, not just 6.--. Pay careful attention to the unit designation (pound, bushel, ton, $1.00, etc.). Values must be appropriate for units. For example, corn for grain should be reported at $1.12 per bushel rather than 2¢ per pound since the unit is bushels.

Owned and Rented - Report acres to nearest 1/10 acre. The number must be complete. Ten acres must be reported 10.0, not 10.

Production - Production should be recorded in whole numbers only. Pay careful attention to the proper unit designation.

Crop Sales - Report sale of each crop separately. Record to the nearest whole dollar.

Fertilizer, Chemicals, Seed & Other - Report values from Pages 38-39, M.F.A.B., for all crops for which complete crop analysis is desired.

Special Hired Labor - Report only labor assigned specifically to a crop such as beet hoeing and thinning, corn detasseling, hand labor for special crops, etc. Do not report general farm labor or labor share of ordinary custom work.

Custom Work - Report total cost of custom work assigned to a specific crop. (Hay baling, combining, picking corn, etc.)

Power & Machinery - Do not write in this space. This column is not used in the analysis procedure.

Land Cost - May report either (a) fair rental value or (b) sum of interest on investment in land plus taxes and insurance. Total cost for the crop should be reported rather than the cost for a single acre. Example, if land value were $20 per acre for 20 acres of oats, the land cost would be reported as $400 in the Land Cost Column.

Miscellaneous Costs - Items such as irrigation costs may appropriately be reported as miscellaneous costs.

SPECIAL INSTRUCTIONS

Line	
Line 91, 101	Other cultivated crops A have a work unit designation of .30 work units per acre. Other cultivated crops B are assigned 2.0 work units per acre. Select the most appropriate cetegory. Report all production in dollars.
Line 301, 311	Land for which diverted acre payment is received should not be reported on either of these lines. Summer fallow-tilled is for land kept black during the summer and is assigned .40 work units per acre. Other tillable land idle does not carry work unit credit. Land for which diverted acre payment is received is recorded in Line 291, Diverted Acres, and is assigned a work unit value of .20.
Line 321	Since wild hay is credited at rate of .20 work units per acre, only land harvested as hay should be reported as wild hay. Wild hay land pastured should be reported as non-tillable pasture; wild hay land not harvested in any fashion should be recorded as part of roads and waste.

FEED FED DATA - FORM 4

Only general instructions are required for this page. Record all quantities in natural units of measure (bushels, cwt., tons, pounds and days). Observe the decimal points very carefully. All numbers must be complete. Ten tons of corn silage must be reported as 10.0 tons. If you record this value as 10 tons, the computer will read only 1.0 tons. Check your work very carefully to avoid error. Blanked-out areas do not permit the feeding of some classes of feeds to certain livestock enterprises. Observe the shaded areas. Figures recorded in these areas will be ignored by the Computer Center. All common grain crops are included in column headings. If a grain crop is fed which has a bushel weight different from any listed, it must be converted to bushels of one of the listed crops.

Pasture days need not be recorded, but the value of pasture is required for the livestock enterprise statements. Whole milk fed and skim milk fed should be recorded in pounds rather than gallons.

THE DOCUMENTATION

The two tasks previously described, revising the output format and designing the input format, were of little value without detailed instructions on how to utilize various pieces of the input in arriving at output values. The project staff prepared the instructions. These instructions specify exactly how each item of output is obtained. The documentation for the current farm business analysis as described by the output format follows. By following the instructions as presented, the reader can easily determine how to calculate each of the output measures.

A brief description of the terms and symbols found in the documentation will aid in its use.

Carry to Tble	The results of the calculations described for this Line are carried forward to be used either in the mathematical calculations for another Line or printed as calculated in the specified place.
P-O-L	Printout Line number as identified in the analysis format. (See pages 17 to 41)
Form	The computer data form from which the data for calculation is retrieved. In some cases, the number is preceded by "T" indicating that the information comes from a previously calculated table rather than directly from the computer data form. (See pages 43 to 46)
Form Line	The first two digits of the form line from which the data was drawn or when preceded by "L," the line number of the previous table from which the information is carried forward.

Print Only	When the description line reads print only, there is no calculation; the format printed line is simply reproduced. This symbol is used for headings or table divisions where no calculations are involved.
Descriptions	When reading the description of the calculations, strict attention must be given to the use of brackets, parentheses and other mathematical instructions.

DOCUMENTATION

Carry to Tble	P-O Line	Form	Form Line	TABLE 1 - FARM INVENTORIES
	1	3	1-36	Sum of sum (Acres Owned + Acres Rented)
	2	3	1-31	Sum of sum (Acres Owned + Acres Rented)
T8,L28	3	3	1-30	Sum of sum (Acres Cropped x Work Units/Acre)
T10,L14				Crops are assigned the following values per acre:

Flax	.30	Hybrid Seed Corn	.55
Barley	.30	Soybeans	.45
Wheat	.30	Corn & Cane Silage	.80
Oats & Oat Mixtures	.30	Corn & Cane Fodder	.80
Rye	.30	Alfalfa Hay	.60
Canning Peas	.30	Other Legume Hay & Mixtures	.40
Potatoes	3.00	Tame Grass Hay	.20
Sugar Beets	2.00	Annual Hay	.30
Other Crops - A	.30	Legume and Grass Silage	.40
Other Crops - B	2.00	Legume Seed	.40
Sunflowers	.55	Grass Seed	.40
Oat Silage	.40	Diverted Acres	.20
Canning Corn	.40	Summer Fallow Tilled	.40
Corn for Grain	.55	Wild Hay	.20

Carry to Tble	P-O Line	Form	Form Line	TABLE 1 - FARM INVENTORIES
T8,L29	4	1	1-14 40-53	Sum of sum (Measure of enterprise size x work units per measurement unit)

Livestock are assigned the following work unit measures; note that in all cases, the cwt. of the product produced is found by adding [Sum of quantities (Ending Inventory + Transferred Out + Butchered + Sales) minus (Beginning Inventory + Transferred In + Purchases)] ÷ 100

Form Line	Animal	Unit	Value/Unit
40	Dairy Cows	Average No. Head - Adults	7.00
41	Other Dairy Cattle	Average No. Head - Others	1.20
42	Beef Breeding Cows	Average No. Head - Adults	1.50
4	Beef Feeders	Cwt.	.12
5	Hogs - Complete	Cwt.	.12
6	Hogs - Finishing	Cwt.	.06
46	Hogs - Weaning Pigs	Litter - Females Bearing	1.40
47	Sheep, Farm Flock	Average No. Head - Adults	.60
9	Lambs, Feeders	Cwt.	.30
49	Chickens, Laying Flock	Average No. Chickens ÷ 100(Adults&Others)	5.00
11	Broilers	Cwt.	.20
51	Turkeys, Laying Flock	Average No. Turkeys ÷ (Adults & Others)	25.00
13	Turkey Poults	Cwt.	.12

Carry to Tble	P-O Line	Form	Form Line	TABLE 1 - FARM INVENTORIES
T8,L30	5	2	45	(Income from Work Off the Farm--Labor Share ÷ 20) = Work Units
T8,L7,8	6	--	--	Sum 3 + 4 + 5 = 6 (Numbers refer to print-out lines)
T8,L8,10	7	2	75,76 72,68 69,11	[Sum (Months Worked by Operator L75) + (Months Worked by Other Partners L76) + (Days Unpaid Family Labor L72 ÷ 25) + (Days of Day Labor Hired L68 ÷ 25) + (Months of Monthly Labor Hired L69) + ([Custom Work Hired--Labor Share L11 ÷ 20] ÷ 25)] ÷ 12 = Man Years Labor
	7A	T1 T1	26 7	[Total Farm Capital, Jan. 1, Dec. 31, T1L26 ÷ 2] ÷ Number of Workers T1L7
	8	--	--	PRINT ONLY

Exhibit C - Documentation for the

Farm Business Analysis

TABLE 1 - FARM INVENTORIES

All values are whole farm share unless specified otherwise.
All summations of line numbers refer to print-out lines.

Carry To Tble	P-O L	Form	Form Line	Jan 1	Dec 31
	9	1	1	Beginning Inv	Ending Inv
	10	1	2	Beginning Inv	Ending Inv
	11	1	3	Beginning Inv	Ending Inv
	12	1	4	Beginning Inv	Ending Inv
	13	1	5, 6, 7	Hogs = Beginning Inv of Hogs--Complete + Hogs--Finishing + Hogs--Weaning Pigs	Hogs = Ending Inv of Hogs--Complete + Hogs--Finishing + Hogs--Weaning Pigs
	14	1	8, 9	Sheep = Beginning Inv of Sheep Farm Flock + Sheep Feeders	Sheep = Ending Inv of Sheep Farm Flock + Sheep Feeders
	15	1	10-13	Poultry = Beginning Inv of Chickens--Laying Hens + Chickens--Broilers + Turkeys--Laying Flock + Turkeys--Poults	Poultry = Ending Inv of Chickens--Laying Hens + Chickens--Broilers + Turkeys--Lahing Flock + Turkeys--Poults
	16	1	14	Beginning Inv	Ending Inv
	17	--	--	Sum 9 + 10 + 11 + 12 + 13 + 14 + 15 + 16 = 17	Sum 9 + 10 + 11 + 12 + 13 + 14 + 15 + 16 = 17
	18	1	15	Beginning Inv	Ending Inv
	19	--	--	PRINT ONLY	
	20	1	16	Beginning Inv	Ending Inv
	21	1	17	Beginning Inv	Ending Inv
	22	1	18	Beginning Inv	Ending Inv
	23	--	--	Sum 20 + 21 + 22 = 23	Sum 20 + 21 + 22 = 23
	24	1	19	Beginning Inv	Ending Inv
	25	1	20	Beginning Inv	Ending Inv
2A, 2B	26	--	--	Sum 17 + 18 + 23 + 24 + 25 = 26	Sum 17 + 18 + 23 + 24 + 25 = 26

Carry To Tble	P-O L	Form	Form Line	TABLE 2A - WHOLE FARM SUMMARY OF CASH RECEIPTS
				All values are whole farm share unless specified otherwise. All summations of line numbers refer to print-out line numbers.
	1	--	--	PRINT ONLY
	2	1	1	Dairy Cows Sales
	3	1	30, 31	Cream Sold + Whole Milk Sold
	4	1	2	Other Dairy Cattle Sales
	5	1	3	Beef Breeding Cattle Sales
	6	1	4	Beef Feeding Cattle Sales
	7A	1	5	Hogs Complete, Sales F1L5
	7B	1	6	Hogs Finishing, Sales F1L6
	7C	1	7	Hogs Weaning Pigs, Sales F1L7
	8A	1	8,341, 351	Sum Sheep Farm Flock Sales F1L8 + Farm Flock Wool Sold F1L341 + Farm Flock Incentive Payment F1L351
	8B	1	9,342, 352	Sum Sheep Feeder Lamb Sales F1L9 + Feeder Lambs Wool Sold F1L342 + Feeder Lambs Incentive Payment F1L352
	9	1	10,11	Sum of (Chickens--Laying Hens Sales + Chickens--Broilers Sales)
	10	1	12,13	Sum of (Turkeys--Laying Flock Sales + Turkeys -- Poults Sales)
	11	1	36,37	Sum of (Chicken Eggs Sold + Turkey Eggs Sold)
	12	1	14	Other Productive Livestock Sales
	12A	--	--	Sum of Items 2 Through 12
	13	--	--	PRINT ONLY
	14	3	14,15	Sum of (Corn for Grain Sales + Hybrid Seed Corn Sales)
	15	3	16,1,11	Sum of (Soybeans Sales + Flax Sales + Sunflowers Sales)
	16	3	2-5	Sum of (Barley Sales + Wheat Sales + Oats Sales + Rye Sales)
	17	3	6-10, 13	Sum of (Canning Peas Sales + Potatoes Sales + Sugar Beets Sales + Canning Corn Sales + Other Crops A Sales + Other Crops B Sales)
	18	3	12,17-25 32,34	Sum of (Sales of Oat Silage + Corn and Cane Silage + Corn and Cane Fodder + Alfalfa Hay + Other Legume Hay and Mixtures + Tame Grass Hay + Annual Hay + Legume Seed + Grass Seed + Timber + Wild Hay + Grass Silage)
	19	3	29	Diverted Acres Sales
	19A	--	--	Sum of Items 14 Through 19
	20	2	20-25	Sum of [Sales of Auto and Truck (Whole Farm Share minus Household and Personal Share) + Power and Crop Machinery + Livestock Equipment + Buildings and Fences + Land + Dwelling (W. F. Share minus HH&P Share)]
	21	2	26	Gas Tax Refund
	22	2	42-45	Sum of (Income From Work off the Farm for Truck + for Power and Crop Machinery + for Livestock Equipment + Labor Share)
	23	2	46	Patronage Refunds
	24	2	47	Miscellaneous Farm Income
	25	--	--	Sum of items 2 through 24 (Except 12A and 19A) = L25
	26	T1	L26	Total Capital at the end of the year minus Total Capital at the beginning of the year; if positive, print; if negative, carry to Table 2B, Line 31 "Decrease in Farm Capital"
	27	F1	1-14, 27-29, 38-39	Sum of (all fourteen classes of livestock--Butchered + Whole Milk Used In House + Skim Milk Used in House + Cream Used in House + Eggs Used in House + Crops Used in House)
2B	28	--	--	Sum of 25 + 26 + 27+ = 28

Carry toTble	P-O L	Form	Form Line	TABLE 2B - WHOLE FARM SUMMARY OF CASH EXPENSES
				All values are whole farm share unless specified otherwise. All summations of line numbers refer to print-out line numbers
	1	--	--	PRINT ONLY
	2	1	1	Dairy Cows Purchases
	3	1	2	Other Dairy Cattle Purchases
	4	1	3	Beef Breeding Cattle Purchases
	5	1	4	Beef Feeder Cattle Purchases
	6A	1	5	Hogs Complete, Purchases F1L5
	6B	1	6	Hogs Finishing, Purchases F1L6
	6C	1	7	Hogs Weaning Pigs, Purchases F1L7
	7A	1	8	Sheep, Farm Flock, Purchases F1L8
	7B	1	9	Sheep, Feeder Lamb, Purchases F1L9
	8	1	10-11	Sum of Purchases of (Chickens--Laying Hens + Chickens--Broilers)
	9	1	12-13	Sum of Purchases of (Turkeys--Laying Flock + Turkeys--Poults)
	10	1	14	Other Productive Livestock Purchases
	11	2	1-2	Sum of Expenses of (Veterinary + Miscellaneous Livestock)
	12	2	3	Feed Bought
	13	2	4	Fertilizers Bought
	14	2	5	Crop Chemicals Bought
	15	2	6	Other Crop Expense
	16	2	8-11	Sum of Custom Work Hired for (Truck + Power and Crop Machinery + Livestock Equipment + Labor Share)
	17	2	12	Repair of Livestock Equipment
	18	2	13	Repair of Real Estate, WF minus HH&P Share
	19	2	27	Gas, Oil, Grease Bought, WF minus HH&P Share
	20	2	31	Repair and Operation of Total Power and Machinery, WF minus HH&P Share
	21	2	35	Wages of Hired Labor
	22	2	36	Property Taxes, WF minus HH&P Share
	23	2	38	General Farm Expense, WF Minus HH&P Share
	24	2	39	Telephone, WF minus HH&P Share
	25	2	40	Electricity, WF minus HH&P Share
2A	26	--	--	Sum of items (2 through 25) = 26
	27	2	14-15	Sum of Purchases of (Auto and Truck, WF minus HH&P Share + Power and Crop Machinery)
	28	2	16	Livestock Equipment Bought
	29	2	17-19	Sum of Purchases of (Buildings and Fences + Land + Dwelling, WF minus HH&P Share)
	30	--	--	Sum of items (26 + 27 + 28 + 29) = 30
	31	T2A	L26	If calculation for Table 2A L26 is negative, print results here.
T3L35	32	T1	L26	[(Total Capital at the beginning of year + Total Capital at the end of year) ÷ 2] x .06
	33	F2	73	Value of Unpaid Family Labor
	34	2	77	Value of Partners' Labor
	35	2	70-71	Sum of (Hired Labor Boarded--Operator + Hired Labor Boarded--Partners)
	36	--	--	Sum of items (30 + 31 + 32 + 33 + 34 + 35) = 36
	37	T2A	L28	Sum of items (Table 2A L28 minus Table 2B L36)
	38	F2	74	Number of Operators on the farm

Carry To Tble	P-O L	Form	Form Line	TABLE 3 - ENTERPRISE STAT.
				All values are whole farm share unless specified otherwise. All summations of line numbers refer to print-out line numbers.
	1	--	--	PRINT ONLY
	2	--	--	PRINT ONLY
	3	1, 4, 1	1, 27-31, 15-24, 1	Dairy Cattle = the sum of (Ending Inv + Transferred Out + Butchered + Sales + Whole Milk Used in House + Skim Milk Used in House + Cream Used in House + Cream Sold + Whole Milk Sold + Sum of Whole Milk Fed L15-24 + Sum of Skim Milk Fed L15-24) minus (Beginning Inv + Transferred In + Purchases)
	4	1	2	Other Dairy Cattle = Sum of (Ending Inv + Transferred Out + Butchered + Sales) minus (Beginning Inv + Transferred In + Purchases)
	5	1	3	Beef Breeding Cattle = sum of (Ending Inv + Transferred Out + Butchered + Sales) minus (Beginning Inv + Transferred In + Purchases)
	6	1	4	Feeder Cattle = Sum of (Ending Inv + Transferred Out + Butchered + Sales) minu (Beginning Inv + Transferred In + Purchases)
	7	1	5	Hogs--Complete = Sum of (Ending Inv + Transferred Out + Butchered + Sales) minus (Beginning Inv + Transferred In + Purchases)
	8	1	6	Hogs--Finishing = Sum of (Ending Inv + Transferred Out + Butchered + Sales) minus (Beginning Inv + Transferred In + Purchases)
	9	1	7	Hogs--Producing Weaning Pigs = Sum of (Ending Inv + Transferred Out + Butchere + Sales) minus (Beginning Inv + Transferred In + Purchases)
	10	1	8, 34, 35, 8	Farm Flock of Sheep = Sum of (Ending Inv + Transferred Out + Butchered + Sales + Farm Flock Wool Sold + Farm Flock Incentive Payment) minus (Beginning Inv + Transferred In + Purchases)
	11	1	9 34, 35	Feeder Lambs = Sum of (Ending Inv + Transferred Out + Butchered + Sales + Feeder Lamb Wool Sold + Feeder Lamb Incentive Payment) minus (Beginning Inv + Transferred In + Purchases)
	12	1	10, 11	Chickens = Sum of [Chickens--Laying Hens Sum of (Ending Inv + Butchered + Sales + *Eggs Used in House + Eggs Sold) minus (Beginning Inv + Transferred I + Purchases)] + [Chickens--Broilers Sum of (Ending Inv + Butchered + Sales + Transferred out) minus (Beginning Inv + Purchases)]
	13	1	12, 13	Turkeys = Sum of [Turkeys--Laying Flock Sum of (Ending Inv + Butchered + Sales **Eggs Used in House + Eggs Sold) minus (Beginning Inv + Transferred In + Purchases)] + [Turkeys--Poults, Sum of (Ending Inv + Transferred Out + Butchered + Sales) minus (Beginning Inv + Purchases)]
	14	1	14	Other Productive Livestock = Sum of (Ending Inv + Butchered + Sales) minus (Beginning Inv + Purchases)
	15	--	--	Sum of (3 through 14) = 15
	16	4	1-24	Sum of (Sum of Values for all feed fed to all classes of livestock)
	17	--	--	Sum of (15 minus 16) = 17
	18	1 3 T3 F2 4 1	15, 39 1-34 16, 3-6 15-24 15	Sum of [Crop, Seed and Feed--Ending Inv F1 L15 + Crop, Seed and Feed Sales F3 L1-34 + Crops Used in House F1 L39 + Value of Crops Fed T3 L16] minus [Feed Bought F2 L3 + Fertilizers Bought F2 L4 + Crop Chemicals Bought F2 L5 + Other Crop Expense F2 L6 + Sum of (Value of Whole Milk Fed F4 L15-24 + Value of Skim Milk Fed F4 L15-24) + Crop, Seed and Feed--Beginning Inv F1 L15]
	19	2	45	Work Off the Farm--Labor Share
	20	2	46	Co-op Patronage Refunds
	21	2	47	Miscellaneous Farm Income
	22	--	--	Sum of (17 + 18 + 19 + 20 + 21) = 22
	23	--	--	PRINT ONLY

* If record reports only chicken or chickens and turkeys

** If record reports turkeys, laying flock, only

Carry To Tble	P-O L	Form	Form Line	TABLE 3 - ENTERPRISE STAT.
10	24 20	1, 2, 1, 2	16, 14, 8, 29, 30, 33, 34, 16, 20, 42	Sum of [Truck and Auto Beginning Inv F1 L16 + Auto and Truck Bought, WF minus HH&P Share F2 L14 + Custom Work Hired--Truck Share F2 L8 + Gas, Oil, Grease-Truck and Auto, WF minus HH&P Share F2 L29, 30 + Repair and Operation of Truck and Auto WF minus HH&P Share F2 L33, 34] minus [Ending Inv of Truck and Auto F1 L16 + Truck and Auto Sold, WF minus HH&P Share F2 L20 + Income from Work Off the Farm--Truck Share F2 L42]
10	25	1, 2, 1, 2	17, 9, 15, 28, 32, 17. 21, 26, 43	Sum of [Tractors and Crop Machinery--Beginning Inv F1 L17 + Custom Work Hired--Power and Machinery F2 L9 + Power and Crop Machinery Bought F2 L15 + Gas, Oil, Grease Bought for Tractor and Crop Machinery F2 L28 + Repair and Operation of Tractor and Crop Machinery F2 L32] minus [Power, Crop and General Machinery--Ending Inv F1 L17 + Power and Crop Machinery Sold F2 L21 Income From Work Off the Farm--for Power and Crop Machinery F2 L43+Gas Tax Refund L2
	26	2	40	Electricity Expense, WF minus HH&P Share
	27	1, 2, 2, 1, 2	18, 10, 12, 16, 18, 44, 22	Sum of (Livestock Equipment--Beginning Inv F1 L18 + Custom Work Hired for Livestock Equipment Share F2 L10 + Repair of Livestock Equipment F2 L12 + Livestock Equipment Bought F2 L16) minus (Livestock Equipment--Ending Inv F1 L18 + Income From Work Off the Farm for Livestock Equipment F2 L44 + Livestock Equipment Sold F2 L22)
	28	1, 2, 1, 2	20, 13, 17, 19, 20, 23, 25	Sum of (Beginning Inv--Buildings, Fencing, Tile F1 L20 + Repair of Real Estat WF minus HH&P Share F2 L13 + Buildings and Fences Bought F2 L17 + Dwelling Bought, WF minus HH&P Share F2 L19) minus (Ending Inv--Buildings, Fencing, Tile F1 L20 + Buildings and Fences Sold F2 L23 + Dwelling Sold, WF minus HH P Share F2 L25)
	29	1, 2	19, 18, 19, 24	Sum of (Land--Beginning Inv F1 L19 + Land Bought F2 L18) minus (Land- Endin Inv F1 L19 + Land Sold F2 L24)
	30	2	1, 2	Sum of (Veterinary Expense L1 + Miscellaneous Expense L2)
	31	2	35, 73 11, 70 71	Sum of (Wages of Hired Labor L35 + Value of Unpaid Family Labor L73 + Custom Work Hired--Labor Share L11 + Hired Labor Boarded--Operator L70 + Hired Labor Boarded--Partners L71)
	32	2	77	Value of Partners' Labor
	33	2	36	Property Tax, WF minus HH&P Share
	34	2	38, 39	Sum of (General Farm Expense, WF minus HH&P Share L38 + Telephone, WF minus HH&P Share L39)
	35	T2B	L32	From Table 2B Line 32 or from Table 1, Line 26 [(Beginning Capital + Ending Capital) ÷ 2] x .06
	36	--	--	Sum (24 through 35) = 36
	37	--	--	Sum (22 minus 36) = 37
	38	2	74	Number of Operators on the Farm

Carry To Tble	P-O L	Form	Form Line	TABLE 4 - HOUSEHOLD EXPENSE	
				All values are household and personal share unless otherwise indicted. All summations of line numbers refer to print-out line numbers.	
	1	2	66	Number of Persons--Total	
	2	2	67	Number of Adult Equivalents	
	3	2	56	Contributions to Church and Welfare	
	4	2	57	Medical Expense	
	5	2	58	Food and Meals Bought	
	6	2	59	Operating Expense and Supplies	
	7	2	60	Furnishings and Equipment	
	8	2	61	Clothing	
	9	2	62	Personal Care and Spending	
	10	2	63	Education	
	11	2	64	Recreation	
	12	2	65	Gifts and Special Events	
	13	2	29, 30 33, 34	Sum of (Gas, Oil, Grease--for Truck L29 + Auto L30 + Repair and Operation of Truck L33 + Auto L34)	
	14	2	13	Repair of Real Estate	
	15	2	39-40	Sum of (Telephone Expense + Electricity Expense)	
	16	--	--	Sum of items (3 through 15) = 16	
	17	2	14	Truck and Auto Bought	
	18	2	19	Dwelling Bought	
	19	2	36, 54	Sum of (Property Taxes L36 + Income and Self-Employment Taxes L54)	
	20	2	51	Investments Made	
T5 L26	21	--	--	Sum of (16 + 17 + 18 + 19 + 20) = 21	
	22	T4	33	Total Family Living From the Farm Table 4 L33	
	23	--	--	Sum of items (21 + 22) = 23	
	24	--	--	PRINT ONLY	
				Note: All values are equal to (Whole Farm Share minus Landlord's Share)	
	25	--	--	PRINT ONLY: AMOUNT	$ OPR SHARE
	26	1	27-29	Sum of the Quantity in quarts of (Whole Milk + Skim Milk + Cream)	Sum of the Value of (Whole Milk + Skim Milk + Cream)
	27	1	1-4	Sum of quantity in pounds of (Dairy Cows Butchered + Other Dairy Butchered + Beef Breeding Cattle Butchered + Beef Feeder Cattle Butchered)	Sum of the value of (Dairy Cows Butchered + Other Dairy Butchered - Beef Breeding Cattle Butchered + Beef Feeders Butchered)
	28	1	5-7	Sum of quantity **butchered** in pounds of (Hogs--Complete + Hogs--Finishing + Hogs--Producing Weaning Pigs)	Sum of value butchered of (Hogs--Complete + Hogs--Finishing + Hogs--Producing Weaning Pigs)
	29	1	8-9	Sum of quantity butchered in pounds of (Sheep Farm Flock + Sheep Feeders)	Sum of value butchered of (Sheep Far Flock + Sheep Feeders)
	30	1	10-13	Sum of quantity butchered in pounds of (Chickens--Laying Hens + Chickens--Broilers + Turkeys--Laying Flock + Turkeys--Poults)	Sum of value butchered of (Chickens--Laying Hens + Chickens--Broilers + Turkeys--Laying Flock + Turkeys--Poults)
	31	1	38	Quantity in dozens of Eggs Used in House	Value per dozen of Eggs Used in Hous
	32	1	39, 14	No Quantity	Sum of value of (Crops Used in Hous + Other Productive Livestock--Butchered)
T4 L22	33	--	--	Sum of the values of items (26 through 32) = 33	

Carry toTble	P-O L	Form	Form Line	TABLE 5 - NET WORTH STATEMENT	
				All values on this page are (Whole Farm Share) minus(Landlord's Share) = Operator's Share All summations of line numbers refer to print-out line numbers.	
				Jan 1	Dec 31
	1	1	1-14	Sum of lines (1 through 14)--Beginning Inv of all livestock	Sum of lines (1 through 14)--Ending Inv of all livestock
	2	1	15	Beginning Inv	Ending Inv
	3	1	16-18	Sum of Beginning Inv of (Auto and Truck L16 + Power, Crop, General Machinery L17 + Livestock Equipment L18)	Sum of Ending Inv of (Auto and Truck L16 + Power, Crop, General Machinery L17 + Livestock EquipmentL18)
	4	1	19	Beginning Inv	Ending Inv
	5	1	20	Beginning Inv	Ending Inv
	6	--	--	Sum of Beginning Inv of items (1 + 2 + 3 + 4 + 5) = 6	Sum of Ending Inv of items (1 + 2 + 3 + 4 + 5) = 6
	7	1	21	Beginning Inv	Ending Inv
	8	1	22	Beginning Inv	Ending Inv
	9	--	--	Sum of Beginning Inv of items (6 + 7 +8) = 9	Sum of Ending Inv of items (6 + 7 + 8) = 9
	10	1	23	Beginning Inv	Ending Inv
	11	1	24	Beginning Inv	Ending Inv
	12	1	25	Beginning Inv	Ending Inv
	13	1	26	Beginning Inv	Ending Inv
	14	--	--	Sum of Beginning Inv of items (10 + 11 + 12 + 13) = 14	Sum of Ending Inv of items (10 + 11 + 12 + 13) = 14
	15	--	--	Sum of items (9 minus 14) = 15	Sum of items (9 minus 14) = 15
	16	--	--	Sum of items [(Ending Inv L15) minus (Beginning Inv L15)]	
	17	--	--	PRINT ONLY	
	18	T6B	L 39	Carry from Table 6B line 39 -- Operator's Labor Earnings	
	19	T6B	L 40	Carry from Table 6B line 40 -- Return to Capital and Family Labor	
	20	--	--	PRINT ONLY	
	21	2	52	Income From Investments	
	22	2	53,55	Sum of (Other Non-Farm Investments L53 + Income Tax Refund L55)	
	23	--	--	Sum of items (21 + 22) = 23	
	24	2	48	Money Borrowed	
	25	2	49	Paid on Debt -- Principal	
	26	T4	L 21	Carry from Table 4, Line 23, Total Cash and Non-Cash Expenses	
	27	T6B T6A	L 38 L 28	Ratio = $\frac{\text{Total Farm Expense T6B L38}}{\text{Total Farm Receipts T6A L28}}$	
	28	--	--	Jan 1	Dec 31
	28	--	--	Total Assets Item 9 ÷ Total Liabilities Item 14	Total Assets Item 9 ÷ Total Liabilities Item 14
	29	T5	--	$\frac{\text{Sum Items 1, 2, 3, 7}}{\text{Sum Items 11, 12, 13}}$	$\frac{\text{Sum Items 1, 2, 3, 7}}{\text{Sum Items 11, 12, 13}}$
	30	T5	--	$\frac{\text{Sum Items 4, 5, 8}}{\text{Item 10}}$	$\frac{\text{Sum Items 4, 5, 8}}{\text{Item 10}}$
	31	T5	--	$\frac{\text{Item 15}}{\text{Item 14}}$	$\frac{\text{Item 15}}{\text{Item 14}}$
	32	T6A T6B	20,25 28	(Cash Operating Expense T6BL28) ÷ (Total Farm Sales T6AL25 Minus Capital Assets Sold T6AL20)	

NOTE: For Lines 29-32, print to two decimals--.xx.

Carry toTble	P-O L	Form	Form Line	TABLE 6A - OPERATOR'S SHARE OF CASH RECEIPTS
				All items are the sum of [Whole Farm Share minus (Landlord's Share + Household and Personal Share)] unless otherwise specified. All summations of line numbers refer to print-out line numbers.
	1	--	--	PRINT ONLY
	2	1	1	Dairy Cows Sales
	3	1	30-31	The sum of (Cream Sold L30 + Whole Milk Sold L31)
	4	1	2	Other Dairy Cattle Sales
	5	1	3	Beef Breeding Cattle Sales
	6	1	4	Beef Feeder Cattle Sales
	7A	1	5	Hogs Complete, Sales F1L5
	7B	1	6	Hogs Finishing, Sales F1L6
	7C	1	7	Hogs, Weaning Pigs, Sales F1L7
	8A	1	8,341, 351	Sum Sheep Farm Flock Sales F1L8 + Sheep Farm Flock Wool Sold F1L341 + Sheep Farm Flock Incentive Payment F1L351
	8B	1	9,342, 352	Sum Sheep Feeder Lamb Sales F1L9 + Sheep Feeder Lamb Wool Sold F1L342 + Sheep Feeder Lamb Incentive Payment F1L352
	9	1	10-11	Sum of Sales of (Chickens--Laying Hens + Chickens--Broilers)
	10	1	12-13	Sum of Sales of (Turkeys--Laying Flock + Turkeys--Poults)
	11	1	36-37	Sum of Sales of (Chicken Eggs + Turkey Eggs)
	12	1	14	Other Productive Livestock Sales
	12A	--	--	Sum Items 2 Through 12
	13	--	--	PRINT ONLY
	14	3	14-15	Sum of Sales of (Corn for Grain + Hybrid Seed Corn)
	15	3	1,16,11	Sum of Sales of (Flax + Soybeans + Sunflowers)
	16	3	2-5	Sum of Sales of (Barley + Wheat + Oats + Rye)
	17	3	6-10,13	Sum of Sales of (Canning Peas + Potatoes + Sugar Beets + Other Crops--A + Other Crops--B + Canning Corn)
	18	3	12,17-25 32,34	Sum of Sales of (Oats Silage + Corn and Cane Silage + Corn and Cane Fodder + Alfalfa Hay + Other Legume Hay and Mixtures + Tame Grass Hay + Annual Hay + Legume and Grass Silage + Legume Seed + Grass Seed + Wild Hay + Timber)
	19	3	29	Diverted Acres Sales
	19A	--	--	Sum Items 14 Through 19
	20	2	20-25	Sum of Sales of (Truck and Auto + Power and Crop Machinery + Livestock Equipment + Buildings and Fences + Land + Dwelling)
	21	2	26	Gas Tax Refund
	22	2	42-45	Sum of Income From Work Off the Farm for (Truck + Power and Crop Machinery + Livestock Equipment + Labor Share)
	23	2	46	Patronage Refunds
	24	2	47	Miscellaneous Farm Income
	25	--	--	Sum of Items 2 Through 24 Except 12A and 19A
T6BL33	26	T5	Line 6	Sum of (Total Farm Capital--Ending Inv minus Total Farm Capital--Beginning Inv = 26; if positive, print. If negative, carry to Table 6B Line 33.
	27	T4	Line33	Total Family Living From the Farm
	28	--	--	Sum of items (25 + 26 + 27) = 28
	29	--	--	Sum of items (25 minus 20) = 29
	30	T6B	Line28	Total Cash Operating Expense
	31	--	--	Sum of items (29 minus 30) = 31

Carry toTble	P-O L	Form	Form Line	TABLE 6B - OPERATOR'S SHARE OF CASH EXPENSES
				All items are equal to the sum of [Whole Farm Share minus (Landlord's Share + Household and Personal Share)] unless specified otherwise. All summations of line numbers refer to print-out line numbers.
	1	--	--	PRINT ONLY
	2	1	1	Dairy Cows Purchases
	3	1	2	Other Dairy Cattle Purchases
	4	1	3	Beef Breeding Cattle Purchases
	5	1	4	Beef Feeder Cattle Purchases
	6A	1	5	Hogs Complete, Purchases
	6B	1	6	Hogs Finishing, Purchases
	6C	1	7	Hogs Weaning Pigs, Purchases
	7A	1	8	Sheep Farm Flock, Purchases
	7B	1	9	Sheep Feeder Lambs, Purchases
	8	1	10-11	Sum of Purchases of (Chickens--Laying Hens + Chickens--Broilers)
	9	1	12-13	Sum of Purchases of (Turkeys--Laying Flock + Turckeys--Poults)
	10	1	14	Other Productive Livestock Purchases
	11	2	1-2	Sum of Expenses of (Veterinary + Miscellaneous Livestock)
	12	2	3	Feed Bought
	13	2	4	Fertilizers Bought
	14	2	5	Crop Chemicals Bought
	15	2	6	Other Crop Expense
	16	2	8-11	Sum of Custom Work Hired for (Truck + Power and Crop Machinery + Livestock Equipment + Labor Share)
	17	2	12	Repair of Livestock Equipment
	18	2	13	Repair of Real Estate
	19	2	27	Total Gas, Oil and Grease Bought
	20	2	32-34	Sum of Repairs for (Tractor and Crop Machinery + Truck + Auto)
	21	2	35	Wages of Hired Labor
	22	2	36	Property Taxes
	23	2	37	Cash Rent Expense
	24	2	38	General Farm Expense
	25	2	39	Telephone Expense
	26	2	40	Electricity Expense
	27	2	50	Paid on Debts--Interest
	28	--	--	Sum of items (2 through 27) = 28
	29	2	14-15	Sum of Purchases of (Auto and Truck + Power and Crop Machinery)
	30	2	16	Livestock Equipment Bought
	31	2	17-19	Sum of Purchases of (Buildings and Fences + Land + Dwelling)
	32	--	--	Sum of items (28 + 29 + 30 + 31) = 32
	33	T6A	Line26	If negative answer to computation for Table 6A line 26, print here.
	34	F1	Line1-20	([Sum of (Total Farm Capital--Ending Inv + Total Farm Capital--Beginning Inv) ÷ 2] x .06) minus (Paid on Debts--Interest F2 L50)
	35	2	73	Unpaid Family Labor
	*			
	37	2	70	Hired Labor Boarded--Operator
	38	--	--	Sum of items (32 through 37) = 38
	39	T6A	Line28	Sum of items (Table 6A Line 28 minus Table 6B Line 38) = 39
	40	--	--	Sum of (Item 39 T6B + Interest on Capital L34 + Unpaid Family Labor L35)
	*			Line 36 Deleted in 1968 Revision

Carry To Tble	P-O L	Form	Form Line	TABLE 8 - MEASURES OF FARM ORGANIZATION
	1	T2B	37	Labor Earnings from Table 2B Line 37, Whole Farm Share
	2	F3	1-25, 29	Computation of Index of Crop Yields requires that four quantities be calculated.

1. Acres of each crop grown = Sum of (Acres Owned + Acres Rented)F3 L1-25, 29 by crop Note: Sum over all crops for calculation of Step 5.
2. Total production of each crop = Sum of (Production Owned + Production Rented F3)by crop
3. Average yield by crop = Sum of (All Production Owned + Production Rented) ÷ Sum of (All Acres Owned + Acres Rented) by crop
4. Acres needed with average yield = Total production of each crop Step 2 ÷ Average yield of each crop Step 3 Note: Sum over all crops for cal. Step5
5. Index of Crop Production = (Sum of Acres Required with Average Yields ÷ Sum of Acres Actually Grown) x 100

Steps 1-4 should be followed for crops from Form 3 Lines 1-25, 29.

Example: Index of Crop Yields

	Acres Grown	Actual Production	Average Yield	Adjusted Acres
Flax	10	100	20	5
Oats	15	900	45	20
Corn	40	4000	80	50
Alfal.	15	60	3	20
	Sum = 80			Sum = 95

(95 ÷ 80) x 100 = 118.7 = Index of Crop Yields

Carry To Tble	P-O L	Form	Form Line	
	3	T9	44	Percent Tillable Land in High Return Crops
	4	F3	1-25, 29	Gross Return per Tillable Acre Excluding Pasture = Σ[Value Per Unit x Sum of (Production Owned + Production Rented)] ÷ Sum of (Tillable Acres minus Pasture)

Example:

Form Line	Acres	Value/Unit		Production (Owned + Rented)		Gross Crop Value
1	Flax	Value	x	Bushels	=	Gross
2	Barley	Value	x	Bushels	=	Gross
3	Wheat	Value	x	Bushels	=	Gross
.		.		.		.
.		.		.		.
25	Grass Seed	Value	x	Pounds	=	Gross
29	Diverted Acres	Value	x	Dollars	=	Gross
	Sum of Acres					Sum of Gross

Sum of Gross ÷ Sum of Acres = Gross Return/Tillable Acre Excluding Pasture.

Carry To Tble	P-O L	Form	Form Line	
	5			Computation of this item requires reference to each of the livestock tables.

Step 1 To	Form	Form Line	Step 1				Step 2		
			Ret/$100 Feed Fed		Ave Ret/$100 Feed Fed		Total Feed Cost		Adj Ret
8 L12	T11A	22, 13A	(T11A L22	÷	T11A L22 Ave.)	x	T11A L13A	=	α
8 L13	T11B	23, 14A	(T11B L23	÷	T11B L23 Ave.)	x	T11B L14A	=	α
8 L14	T11C	22, 13A	(T11C L22	÷	T11C L22 Ave.)	x	T11C L13A	=	α
8 L15	T12	32, 23A	(T12 L32	÷	T12 L32 Ave.)	x	T12 L23A	=	α
8 L16	T13	22, 13A	(T13 L22	÷	T13 L22 Ave.)	x	T13 L13A	=	α
8 L17	T14	23, 14A	(T14 L23	÷	T14 L23 Ave.)				
8 L18	T15A	24, 15A	(T15A L24	÷	T15A L24 Ave.)	x	T15A L15A	=	α

TABLE 8 - MEASURES OF FARM ORGANIZATION

Carry To Tble	P-0 L	Form	Form Line	Step Step 1		Step 2	
Step 1				Ret/$100 Feed Fed	Ave Ret/$100 Feed Fed	Total Feed Cost	Adj Ret
8 L19		T15B	23, 14A	(T15B L23	÷ T15B L23 Ave.)	x T15B L14A =	✓
8 L20		T16A	27, 18A	(T16A L27	÷ T16A L27 Ave.)	x T16A L18A =	✓
8 L21		T16B	23, 14A	(T16B L23	÷ T16B L23 Ave.)	x T16B L14A =	✓
8 L22		T17A	16, 11A	(T17A L16	÷ T17A L16 Ave.)	x T17A L11A =	✓
8 L23		T17B	13, 8A	(T17B L13	÷ T17B L13 Ave.)	x T17B L8A =	✓
8 L25		T18	13, 8A	(T18 L13	÷ T18 L13 Ave.)	x T18 L8A =	✓
8 L24		F1 F4	12, 37-38 12	[[(Sum of Value [Ending Inv + Butchered + Sales + Turkey Eggs Sold + Eggs Used in House] minus Sum of Value [Beginning Inv + Transferred In + Purchases]) ÷ (Sum of Value [Corn + Oats + Barley + Rye + Wheat + Protein + Complete Ration + Legume Hay])] x100] ÷ Ave. Values for Return/$100 Feed Fed to Turkeys--Laying Flock		x Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein + Complete Ration + Legume Hay) =	✓
		F1 F4	14 14, 24	[[(Sum of Value [Ending Inv + Butchered + Sales] minus Sum of Value [Beginning Inv + Purchases]] ÷ (Sum of Value [Corn + Oats + Barley + Rye + Wheat + Protein + Complete Feed + Legume Hay + Other Hay + Corn Silage + Grass Silage + Fodder & Stover + Pasture + Whole Milk + Skim Milk])] x100] ÷ Ave. Values for Return/$100 Feed Fed to Other Productive Livestock		x Sum of Values Feed Fed F4 L14, 24 =	✓
				Sum of Adjusted Return ÷ Sum Total Feed Costs = Index of Return/$100 Feed Fed		Sum Tot. Feed Cost	Sum Ad Ret
	6	1		Sum (Dairy Cows, Ave. No. Adults F1 L40 x 1) + ([Other Dairy Cattle, Ave. No. Adults F1 L41 x 1] + [Other Dairy, Ave. No. Other x .5]) + ([Beef Breeding, Ave. No. Adults F1 L42 x .80] + [Beef Breeding, Ave. No. Other x .30]) + ([Beef Feeders, Ave. No. Adults F1 L43 x 1] + [Beef Feeders, Ave. No. Other x 1]) + ([Hogs--Complete, Ave. No. Adults F1 L44 x.4] + [Hogs--Complete, Ave. No. Other x .2]) + ([Hogs--Finishing, Ave. No. Adults F1 L45 x .4] + [Hogs--Finishing, Ave No. Other x .2]) + ([Hogs--Weaning Pigs, Ave. No. Adults F1 L46 x .4] + [Hogs--Weaning Pigs, Ave. No. Other x .2]) + ([Sheep Farm Flock, Ave. No. Adults F1 L47 x .143] + [Sheep Farm Flock, Ave. No. Other x .071]) + ([Sheep Feeders, Ave. No. Adults F1 L47 x .143] + [Sheep Feeders, Ave. No. Other x .071]) + ([Chickens--Laying Flock, Ave. No. Adults F1 L48 x .02] + [Chickens--Laying Flock, Ave. No Other x .02]) + ([Chickens--Broilers F1 L11 Sum of Quantity (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Quantity (Beginning Inv + Purchases)] ÷ 1100) + ([Turkeys--Laying Flock, Ave. No. Adults F1 L51 x .04] + [Turkeys--Laying Flock, Ave. No. Others x .04]) + ([Turkey Poults F1 L13 Sum of Quantity (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Quantity (Beginning Inv + Purchases)] ÷ 1100) + ([Other Productive Livestock F1 L14 Sum of Value (Beginning Inv + Ending Inv) ÷ 2)] ÷ 300)			
			1-33	Divide the above sum by Sum of Sum (Acres Owned + Acres Rented) F3 L1-33			

Carry toTble	P-O L	Form	Form Line	TABLE 8 - MEASURES OF FARM ORGANIZATION
	7	T1	6	Total Size of Business--Work Units T1 L6
	8	T1	6,7	Total Size of Business--Work Units T1 L6 ÷ Number of Workers T1 L7
	9	T3	24-28	[Sum of Net Decreases (Truck and Auto T3 L24 + Tractors and Crop Machinery T3 L25 + Electricity T3 L26 + Livestock Equipment T3 L27 + Buildings T3 L28)] ÷ Total Size of Business--Work Units T8 L7
	10	T1	26	[Sum Total Farm Capital (Beginning Inv. + Ending Inv) ÷ 2] ÷ Number of Workers T1 L7
	11	--	--	PRINT ONLY: Index of Return for $100 Feed From
	12	--	--	Complete Hog Enterprise from T8 L5 Step 1
	13	--	--	Hog Finishing Enterprise - T8 L5 Step 1
	14	--	--	Producing Weaning Pigs - T8 L5 Step 1
	15	--	--	Dairy Cattle - T8 L5 Step 1
	16	--	--	Other Dairy - T8 L5 Step 1
	17	--	--	All Dairy & Dual Purpose Cattle - T8 L5 Step 1
	18	--	--	Beef Breeding Cattle - T8 L5 Step 1
	19	--	--	Beef Feeder Cattle - T8 L5 Step 1
	20	--	--	Sheep Farm Flock - T8 L5 Step 1
	21	--	--	Feeder Lambs - T8 L5 Step 1
	22	--	--	Chickens--Laying Flock - T8 L5 Step 1
	23	--	--	Chickens--Broilers - T8 L5 Step 1
	24	--	--	Turkeys--Laying Flock - T8 L5 Step 1
	25	--	--	Turkey Poults - T8 L5 Step 1
	26	--	--	Other Productive Livestock - T8 L5 Step 1
	27	--	--	Sum of Animal Units for all Productive Livestock from T8 L6 Step 1
	28	--	--	PRINT ONLY
	29	T1	3	Work Units--Crops from T1 L3
	30	T1	4	Work Units--Livestock from T1 L4
	31	T1	5	Work Units--Other from T1 L5
	32	--	--	PRINT ONLY
	33	T3	25	(Tractor and Crop Machinery Expense T3 L25) ÷ (Total Work Units T8 L7
	34	T3	24	(Truck and Auto Expense T3 L24) ÷ (Total Work Units T8 L7)
	35	T3	26	(Farm Share Electricity T3 L26) ÷ (Total Work Units T8 L7)
	36	T3	27	(Livestock Equipment Expense T3 L27) ÷ (Total Work Units T8 L7)
	37	T3	28	(Buildings, Fences and Tiling T3 L28) ÷ (Total Work Units T8 L7)
	38	T3	25	(Tractor and Crop Machinery Expense T3 L25) ÷ (Sum of Sum [Acres Owned + Acres Rented F3 L1-32])
	39	--	--	PRINT ONLY
	40	--	--	PRINT ONLY

TABLE 9 - CROP PRODUCTION

All summations of line numbers refer to print-out line numbers.

Carry To Tble	P-O L	Form	Form Line	Crop	Crop Rank	Acres Owned + Acres Rented	(Prod. Owned + Prod. Rented) / (Acres Owned + Acres Rented)
	1	3	4	Oats and Mixtures	"	"	"
	2	3	12	Oat Silage	"	"	"
	3	3	6	Canning Peas	"	"	"
	4	3	3	Wheat	"	"	"
	5	3	2	Barley	"	"	"
	6	3	1	Flax	"	"	"
	7	3	5	Rye	"	"	"
	8	--	--	Sum of items (1 through 7) = 8	--	"	--
	9	3	13	Canning Corn	"	"	"
	10	3	14-15	Sum of (Corn for Grain + Hybrid Seed Corn)	"	"	"
	11	3	16	Soybeans	"	"	"
	12	3	17	Corn and Cane Silage	"	"	"
	13	3	18	Corn and Cane Fodder	"	"	"
	14	3	7	Potatoes	"	"	"
	15	3	8	Sugar Beets	"	"	"
	16	3	11	Sunflowers	"	"	"
	17	3	9	Other Cultivated Crops--A	"	"	"
	18	3	10	Other Cultivated Crops--B	"	"	"
	19	--	--	Sum of items (9 through 18) = 19		"	--
	20	3	19	Alfalfa Hay	"	"	"
	21	3	20	Other Legume Hay and Mixtures	"	"	"
	22	3	21	Tame Grass Hay	"	"	"
	23	3	22	Annual Hay	"	"	"
	24	3	23	Legume and Grass Silage	"	"	"
	25	3	24	Legume Seed	"	"	"
	26	3	25	Grass Seed	"	"	"
	27	--	--	Sum of items (20 through 26) = 27		"	--
	28	3	26	Alfalfa and Mixed Pasture	"	"	"
	29	3	27	Other Legume Pasture	"	"	"
	30	3	28	Other Tillable Pasture	"	"	"
	31	--	--	Sum of items (28 + 29 + 30) = 31		"	--
	32	3	29	Diverted Acres	"	"	"
	33	3	30	Summer Fallow--Tilled	"	"	--
	34	3	31	Other Tillable Land Idle	"	"	--
	35	--	--	Total Tillable Land = Sum of items (8+19 + 27 + 31 + 32 + 33 + 34) = 35		"	--
	36	3	32	Wild Hay	--	"	"
	37	3	33	Non-Tillable Pasture	--	"	--
	38	3	34	Timber	--	"	"

Carry toTble	P-O L	Form	Form Line	TABLE 9 - CROP PRODUCTION Crop	Crop Rank	Acres Owned + Acres Rented	$\left(\frac{\text{Prod. Owned + Prod. Rented}}{\text{Acres Owned + Acres Rented}}\right.$
	39	3	35	Roads and Waste	--	"	--
	40	3	36	Farmstead	--	"	--
	41	--	--	Total Acres in Farm = Sum of Items (35 through 40) = 41		"	--
	42	--	--	PRINT ONLY			
	43	T9 T9	35 41	Percent Land Tillable = $\left(\frac{\text{Total Tillable Land T9 L35}}{\text{Total Acres in Farm T9 L41}}\right) \times 100$			
	44	3	1-31	Percent in High Return Crops Actual Number of Acres--Crop Rank A x 1.00 = Adjusted Acres--Crop Rank A Actual Number of Acres--Crop Rank B x .50 = Adjusted Acres--Crop Rank B Actual Number of Acres--Crop Rank C x .25 = Adjusted Acres--Crop Rank C Actual Number of Acres--Crop Rank D x 0 = 0 Sum of Actual Number of Acres of (Crop Rank A + Crop Rank B + Crop Rank C + Crop Rank D) = Total Number of Acres Sum of Adjusted Acres of (Crop Rank A + Crop Rank B + Crop Rank C) = Total Number of Adjusted Acres $\frac{\text{Total Number of Adjusted Acres}}{\text{Total Number of (Actual) Acres}} \times 100$ = Percent Land in High Return Crops			
	45	2 T9	4 35,31	$\frac{\text{Fertilizer Cost F2 L4, Whole Farm}}{\text{Total Tillable Land T9 L35 minus Total Tillable Pasture T9 L31}}$			
	46	2 T9	5 35,31	$\frac{\text{Crop Chemical Costs, Whole Farm F2 L5}}{\text{Total Tillable Land T9 L35 minus Total Tillable Pasture T9 L31}}$			
	47	2 T9	6 35,31	$\frac{\text{Other Crop Expenses, Whole Farm F2 L6}}{\text{Total Tillable Land T9 L35 minus Total Tillable Pasture T9 L31}}$			
	48	2 T9	26,28 35,31	[Gas, Oil, Grease Bought, WF, Tractor and Crop Machinery F2L28 Minus Gas Tax Refund, WF, F2L26] ÷ Total Tillable Land T9L35 Minus Total Tillable Pasture T9L31			
	49	--	--	PRINT ONLY			

Carry toTble	P-O L	Form	Form Line	TABLE 10-01 CROP DATA FOR FLAX
				All summations of line numbers refers to Print-out line numbers Acres = (Acres owned + Acres rented) Tables will be printed for crops listed on Form 3, Lines 1 through 25 and 29 Print table only if Acres is greater than zero (0) Print crop name in table heading; key from Form 3, Lines 1 through 25 and 29 The instructions which follow are the same for each crop table. Flax is used as an example for this documentation.
		3	1-25	Sum of (Acres owned + Acres rented), if = 0. go to next crop line; If > 0 print: Table 10-01 Crop Data for Flax
	1B	3	1	Flax: Sum of (Acres owned + Acres rented) = Total Acres
	2A	3	1	Flax: Sum of (Production owned + Production rented) ÷ Total Acres
	3A	3	1	Flax: Print value per unit
T8L4	4A	3	1	Flax: (Value per unit) x (Yield per acre) = Gross return per acre
	4B	--	--	Flax: 4A x Total Acres (1B)
	5	--	--	PRINT ONLY
	6A	3	1	Flax: Fertilizer ÷ Total Acres (1B)
	7A	3	1	Flax: Chemicals ÷ Total Acres (1B)
	8A	3	1	Flax: Seed and Other ÷ Total Acres (1B)
	9A	3	1	Flax: Hired Labor ÷ Total Acres (1B)
	10A	3	1	Flax: Custom Work ÷ Total Acres (1B)
	11A	--	--	Sum of items (6+7+8+9+10) = Total supplementary costs per acre
	11B	--	--	11A x Total Acres (1B) = Total Supplementary Costs
	12A	--	--	Line 4A minus Line 11A = Return over Supplementary Costs per Acre
	12B	--	--	Line 4B minus Line 11B = Total return over supplementary costs
	13	--	--	PRINT ONLY
Subseq. Crop Tables 10-01-10-25 and 10-29	14			Step one: Determine Power and Machinery Cost Per Crop Work Unit.
		T3 F2 T1 T1	24,25 8, 9 4 3	[Sum [Net Decrease (Truck and Auto T3L24) + (Tractor & Crop Machinery T3L25)] Minus [(Custom work hired, Truck and Auto F2L8) + (Custom work hired, Tractor and Crop Machinery F2L9)]] ÷ [(Work Units on Crops T1L3) + (work units on Livestock T1L4 ÷ 10 if T1L4 < 400 or ÷ 12 if T1L4 ≥ 400)] equals Power & Machinery Expense Per Crop Work Unit.
				Step two: Costs for Specific Crops
	14A			(Power and Machinery Expense per Crop Work Unit) x (Work Units per acre for Flax) = Power and Machinery Expense per Acre(Flax) Work units per acre are derived from information in Table 1, Line 3 Program must be keyed to bring in appropriate work unit value for ea. crop
	15A	3	1	Land Cost ÷ Total Acres (1B)
	16A	3	1	Miscellaneous Costs ÷ Total Acres (1B)
	17A	--	--	Sum of (14A + 15A + 16A) = Total Allocated Costs per Acre
	17B	--	--	17A x Total Acres = Total Allocated Costs
	18a	--	--	Total Costs (L 18B) ÷ Total Production (F3 L1) = Total Cost per Unit
	18A	--	--	Sum of (L 11A + L 17A) = Total Costs per Acre
	18B	--	--	Sum of (L 11B + L 17B) = Total Costs
	19A	--	--	(Line 4A Minus Line 18A) = Return over total listed costs per acre
	19B	--	--	(Line 4B Minus Line 18B) = Return over total listed costs

Carry To Tble	P-O L	Form	Form Line	TABLE 11A - COSTS AND RETURNS FROM COMPLETE HOG ENTERPRISE
				All values are equal to the Whole Farm Share unless indicated otherwise. All summations of line numbers refer to print-out line numbers.
				A = Herd Total Column; B = Per Cwt. Pork Produced Column
	1A	1	5	Sum of Quantity (Ending Inv + Butchered + Transferred Out + Sales) minus Sum of Quantity (Beginning Inv + Transferred In + Purchases) Computation for Cwt*: Line 1A ÷ 100 = Cwt* Pork Produced
	2A	1	5	Sum of Value (Ending Inv + Butchered + Transferred Out + Sales) minus Sum of Value (Beginning Inv + Transferred In + Purchases)
	2B	--	--	2A ÷ Cwt*
	3	--	--	PRINT ONLY
	4B	4	5	Bushels of Corn x 56 Cwt*
	5B	4	5	Sum of Bushels [(Oats x 32) + (Barley x 48) + (Rye x 56) + (Wheat x 60)] Cwt*
	6B	4	5, 19	Sum of [(Cwt. Protein, Salt and Mineral x 100) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)] ÷ Cwt*
	7B	4	5	(Tons Complete Ration x 2000) ÷ Cwt*
	8B	--	--	Sum of items (4B + 5B + 6B + 7B = 8B
	9B	4	5, 19	[Sum of Tons (Legume Hay + Other Hay + Corn Silage + Grass Silage) x 2000] ÷ Cwt
	10	--	--	PRINT ONLY
	11B	4	5, 19	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Minera Complete Ration + Legume Hay + Other Hay + Corn Silage + Grass Silage + Whole Milk Fed + Skim Milk Fed) ÷ Cwt*
	12B	4	19	Value Pasture ÷ Cwt*
	13B	--	--	Sum of items (11B + 12B)
	13A	--	--	13B x Cwt*
	14A	--	--	Sum of items (2A minus 13A)
	14B	--	--	Sum of items (2B minus 13B)
	15	--	--	PRINT ONLY
	16B	1	44	Miscellaneous Livestock Expense ÷ Cwt*
	17B	1	44	Veterinary Expense ÷ Cwt*
	18B	1	44	Custom Work ÷ Cwt*
	19B	--	--	Sum of items (16B + 17B + 18B)
	19A	--	--	19B x Cwt*
	20A	--	--	Sum of items (14A minus 19A)
	20B	--	--	Sum of items (14B minus 19B)
	21	--	--	PRINT ONLY
	22	--	--	(L2A ÷ L13A) x 100
	23	1	5	(Value Sales ÷ Pounds Sold) x 100
	24	1	44	Females Bearing
	25	1	44	Number Born ÷ Females Bearing T11A L24
	26	1	44	Sum of (Number Born minus No. Young Died) ÷ Females Bearing T11A L24
	27	1	44	[Sum of (Number Young Died + Number Old Died) ÷ Sum of (Number Beginning In Number Purchased + Number Transferred In + Number Born)] x 100
	28	1	5	Quantity of Sales
		1	44	Number Sold
	29	4	5	([Sum of Values (Corn + Oats + Barley + Rye + Wheat + Protein, Salt and Minera + Complete Ration + Whole Milk + Skim Milk)] ÷ [Sum of (Bushels of Corn x 5 + (Bushels of Oats x 32) + (Bushels of Barley x 48) + (Bushels of Rye x 56) + (Bu. Wheat x 60) + (Bushels of Protein, Salt & Mineral x 100) + (Tons of complete Ration x 20 + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)]) x 100
	30	1	5	Quantity Purchased in Pounds

Carry To Tble	P-O L	Form	Form Line	TABLE 11B - COSTS AND RETURNS FROM HOG FINISHING ENTERPRISE
				All values are equal to the Whole Farm Share unless indicated otherwise. All summations of line numbers refer to print-out line numbers. A = Herd Total Column; B = Per Cwt. Pork Column
	1A	1	45	Sum of (Average Number of Adults + Average Number Other)
	2A	1	6	[Sum of Quant. (Ending Inv + Transferred Out + Butchered + Sales)] minus [Sum Quant. (Beginning Inv + Transferred In + Purchases)]
				2A ÷ 100 = Cwt* Pork Produced
	3B	1	6	[Sum of Value (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Value (Beginning Inv + Transferred In + Putchases)] ÷ Cwt*
	3A	--	--	L3A = L3B x Cwt*
	4	--	--	PRINT ONLY
	5B	4	6	(Bushels Corn x 56) ÷ Cwt*
	6B	4	6	[Sum of (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60)] ÷ Cwt*
	7B	4	6, 20	[Sum of (Cwt. Prot, Salt & Min x 100) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)] ÷ Cwt*
	8B	4	6	(Tons Complete Ration x 2000) ÷ Cwt*
	9B	--	--	Sum of items (5B + 6B + 7B + 8B) = 9B
	10B	4	6	[Sum of Tons (Legume Hay x 2000) + (Other Hay x 2000) + (Corn Silage x 2000) + (Grass Silage x 2000)] ÷ Cwt*
	11	--	--	PRINT ONLY
	12B	4	6, 20	[Sum of Values (Corn + Oats + Barley + Rye + Wheat + Prot, Salt & Min + Complete Ration + Legume Hay + Other Hay + Corn Silage + Grass Silage + Whole Milk Fed + Skim Milk Fed)] ÷ Cwt*
	13B	4	20	Value of Pasture ÷ Cwt* *
	14B	--	--	Sum of items (12B + 13B) = 14B
T8,L5	14A	--	--	L14B x Cwt*
	15A	--	--	L3A minus L14A
	15B	--	--	L3B minus L14B
	16	--	--	PRINT ONLY
	17B	1	45	Miscellaneous Livestock Expense ÷ Cwt*
	18B	1	45	Veterinary Expense ÷ Cwt*
	19B	1	45	Custom Work ÷ Cwt*
	20B	--	--	Sum of items (17B + 18B + 19B) = 20B
	20A	--	--	L20B x Cwt*
	21A	--	--	L15A minus L20A
	21B	--	--	L15B minus L20B
	22	--	--	PRINT ONLY
T8,L5	23	--	--	(L3A ÷ L14A) x 100
	24	1	6	(Value of Sales ÷ Pounds Sold) x 100
	25	1	6, 45	Pounds Sold ÷ Number Sold
	26	1	6, 45	Value Purchased ÷ Number Purchased
	27	1	6, 45	Pounds Purchased ÷ Number Purchased
	28	1	45	Number Purchased
	29	1	6	Pounds Purchased
	30	1	6	[Sum of (Number Young Died + Number of Old Died) ÷ Sum of (Number Beginning Inv + Number Purchased + Number Transferred In + Number Born) x 100
	31	4	6, 20	([Sum of Values (Corn + Oats + Barley + Rye + Wheat + Prot, Salt & Min + Complete Feed + Whole Milk + Skim Milk)] ÷ [Sum of (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60) + (Cwt Prot, Salt & Min x 100) + (Tons Complete Ration x 2000) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)]) x 100

Carry To Tble	P-O L	Form	Form Line	TABLE 11C - COSTS AND RETURNS FROM PRODUCING WEANING PIGS
				All values are equal to the Whole Farm Share unless indicated otherwise. All summations of line numbers refer to print-out line numbers. A = Herd Total Column; B = Per Litter Column
	1A	1	46	Females Bearing
	2A	1	7	[Sum of Values (Ending Inv + Transferred Out + Butchered + Sales)] minus [Sum of Values (Beg. Inv + Tranferred In + Purchases)]
	2B	--	--	L2A ÷ L1A
	3	--	--	PRINT ONLY
	4B	4	7	(Bushels Corn x 56) ÷ L1A
	5B	4	7	[Sum of (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60)] ÷ L1A
	6B	4	7, 21	[Sum of (Cwt. Prot, Salt & Min x 100) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)] ÷ L1A
	7B	4	7	(Tons Complete Ration x 2000) ÷ L1A
	8B	--	--	Sum of items (4B + 5B + 6B + 7B) = 8B
	9B	4	7, 21	[Sum of Tons (Legume Hay x 2000) + (Other Hay x 2000) + (Corn Silage x 2000) + (Grass Silage x 2000)] ÷ L1A
	10	--	--	PRINT ONLY
	11B	4	7, 21	Sum of Values (Corn + Oats + Barley + Rye + Wheat + Prot, Salt & Min + Complete Feed + Legume Hay + Other Hay + Corn Silage + Grass Silage + Whole Milk Fed + Skim Milk Fed) ÷ L1A
	12B	4	21	Value of Pasture ÷ L1A
	13B	--	--	Sum of items (11B + 12B)
T8,L5	13A	--	--	L13B x L1A
	14A	--	--	Sum of items (L2A minus L13A)
	14B	--	--	Sum of items (L2B minus L13B)
	15	--	--	PRINT ONLY
	16B	1	46	Miscellaneous Livestock Expense ÷ L1A
	17B	1	46	Veterinary Expense ÷ L1A
	18B	1	46	Custom Work ÷ L1A
	19B	--	--	Sum of items (16B + 17B + 18B)
	19A	--	--	L19B x L1A
	20A	--	--	Sum of items (L14A minus L19A)
	20B	--	--	Sum of items (L14B minus L19B)
	21	--	--	PRINT ONLY
T8,L5	22	--	--	(L2A ÷ L13A) x 100
	23	1	7, 46	Value of Sales ÷ Number Sold
	24	1	46	Sum of Number (Ending Inv + Transferred Out + Butchered + Sold) minus Sum of Number (Beginning Inv + Transferred In + Purchased)
	25	1	46	Number Born ÷ Females Bearing L1A
	26	1	46	Sum of (Number Born minus Number Young Died) ÷ Females Bearing L1A
	27	1	46	[Sum of (Number Young Died + Number Old Died) ÷ Sum of (Number Beginning Inv + Number Transferred In + Number Purchases + Number Born)] x 100
	28	4	7, 21	[Sum of Value (Corn + Oats + Barley + Rye + Wheat + Prot, Salt & Min + Complete Feed + Whole Milk Fed + Skim Milk Fed) ÷ Sum of (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60) + (Cwt Prot, Salt & Min x 100) + (Tons Complete Feed x 2000) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)] x 100
	29	--	--	[Sum of items (L13A + L19A)] ÷ L24

Carry To Tble	P-O L	Form	Form Line	TABLE 12 - DAIRY COWS
				All values are equal to the Whole Farm Share unless indicated otherwise. All summations of line numbers refer to print-out line numbers. A = Herd Total Column; B = Per Cow Column
	1A	1	40	Average Number of Adults
	2B	1 4	27-31 15-24	[Sum of Quantity (Whole Milk Used in House, Quarts x 2.15) + (Skim Milk Used in House, Quarts x 2.15) + (Cream Used in House x 2.1) + (Cream Sold, Lbs. B.F. x 4) + (Pounds Whole Milk Sold) + (Pounds Whole Milk Fed) + (Pounds Skim Milk Fed)] ÷ L1A
12 L4A	3B	1	27, 29-30 32	Step 1: (Pounds of Butterfat in Milk Sold ÷ Pounds of Whole Milk Sold) = Percent Butterfat in Milk
		4	15-24	Step 2: (Sum of Quantity [(Whole Milk Used in House x 2.15) x % BF] + [(Cream Used in House x 2.1) x .25* (* Estimated BF Test)] + (Pounds BF Sold in Cream) + (Pounds BF Sold in Milk) + (Whole Milk Fed x % BF)) ÷ L1A **Print** here
	4A	--	--	Carry from step 1 L3B--Percent of Butterfat in Milk
	5	--	--	PRINT ONLY
	6B	1	30-31	Sum of Value (Cream Sold + Whole Milk Sold) ÷ L1A
	7B	1	27-29	Sum of Value (Whole Milk Used in House + Skim Milk Used in House + Cream Used in House) ÷ L1A
	8B	4	15-24	Sum of [Sum (Value Whole Milk Fed to Livestock + Value Skim Milk Fed to Livestock)] ÷ L1A
	9B	1	1	Sum of Value (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Value (Beginning Inv + Transferred In + Purchases)
	10B	--	--	Sum of items (6B + 7B + 8B + 9B)
	10A	--	--	L10B x L1A
	11	--	--	PRINT ONLY
	12B	4	1	(Bushels Corn x 56) ÷ L1A
	13B	4	1	[Sum (Bushels Oats x 32) + (Bushels Barley x 48) + Bushels Rye x 56) + (Bushels Wheat x 60) + (Tons Complete Ration x 2000)] ÷ L1A
	14B	4	1	(Cwt. Protein, Salt & Mineral x 100) ÷ L1A
	15B	--	--	Sum of items (12B + 13B + 14B)
	16B	4	1	(Tons Legume Hay x 2000) ÷ L1A
	17B	4	15	[Sum of (Tons Other Hay x 2000) + (Tons Fodder and Stover x 2000)] ÷ L1A
	18B	4	15	[Sum of (Tons Corn Silage x 2000) + (Tons Grass Silage x 2,000] ÷ L1A
	19	--	--	PRINT ONLY
	20B	4	1	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Feed) ÷ L1A
	21B	4	1, 15	Sum of Value (Legume Hay + Other Hay + Corn Silage + Grass Silage + Fodder and Stover) ÷ L1A
	22B	4	15	Value of Pasture ÷ L1A
	23B	--	--	Sum of items (20B + 21B + 22B)
	23A	--	--	L23B x L1A
	24A	--	--	Sum of items (L10A minus 23A)
	24B	--	--	Sum of items (L10B minus 23B)
	25	--	--	PRINT ONLY
	26B	1	40	Miscellaneous Livestock Expense ÷ L1A
	27B	1	40	Veterinary Expense ÷ L1A
	28B	1	40	Custom Work ÷ L1A
	29B	--	--	Sum of items (26B + 27B + 28B)
	29A	--	--	L29B x L1A
	30A	--	--	Sum of items (24A minus L29A)
	30B	--	--	Sum of items (24B minus L29B)
	31	--	--	PRINT ONLY
	32	--	--	(L10A ÷ L23A) x 100

Carry toTble	P-O L	Form	Form Line	TABLE 12 - DAIRY COWS
	33	--	--	(L23B ÷ L2B) x 100
	34	--	--	(L23B ÷ L3B)
	35	--	--	(L2B ÷ L15B)
	36	1	31	(Value Whole Milk Sold ÷ Pounds Whole Milk Sold) x 100
	37	1	32,31	Value Whole Milk Sold ÷ Pounds BF in Milk (Note: Cream Sales are ignored)

Carry To Tble	P-O L	Form	Form Line	TABLE 13 - OTHER DAIRY CATTLE
				All values are equal to the Whole Farm Share unless indicated otherwise. All summations of line numbers refer to print-out line numbers. A = Herd Total Column; B = Per Head Column
	1A	1	41	Average Number of Other Dairy Cattle
	2B	1	2	[Sum of Value (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Value (Beginning Inv + Transferred In + Purchases)] ÷ L1A
	2A	--	--	L2B x L1A
	3	--	--	PRINT ONLY
	4B	4	2	[Sum (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60) + (Cwt. Protein, Salt & Mineral x 100) + (Tons Complete Ration x 2000)] ÷ L1A
	5B	4	2, 16	[Sum (Tons Legume Hay x 2000) + (Tons Other Hay x 2000) + (Tons Fodder and Stover x 2000)] ÷ L1A
	6B	4	16	[Sum (Tons Corn Silage x 2000) + (Tons Grass Silage x 2000)] ÷ L1A
	7B	4	16	Sum (Pounds Whole Milk + Pounds Skim Milk) ÷ L1A
	8	--	--	PRINT ONLY
	9B	4	2	[Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Ration)] ÷ L1A
	10B	4	2, 16	[Sum of Value (Legume Hay + Other Hay + Corn Silage + Grass Silage + Fodder and Stover)] ÷ L1A
	11B	4	16	Sum of Value (Whole Milk Fed + Skim Milk Fed) ÷ L1A
	12B	4	16	Value of Pasture ÷ L1A
	13B	--	--	Sum of items (9B + 10B + 11B + 12B)
	13A	--	--	L13B x L1A
	14A	--	--	Sum of items (L2A minus L13A)
	14B	--	--	Sum of items (L2B minus L13B)
	15	--	--	PRINT ONLY
	16B	1	41	Miscellaneous Livestock Expense ÷ L1A
	17B	1	41	Veterinary Expense ÷ L1A
	18B	1	41	Custom Work ÷ L1A
	19B	--	--	Sum of items (16B + 17B + 18B)
	19A	--	--	L19B x L1A
	20A	--	--	Sum of items (14A minus 19A)
	20B	--	--	Sum of items (14B minus 19B)
	21	--	--	PRINT ONLY
	22	--	--	(L2A ÷ L13A) x 100
	23	1	41	[Number of Young Died + Number of Old Died] ÷ Sum of Number (Beginning Inv + Purchases + Transferred In + Born)] x 100

Carry To Table	P-O L	Form	Form Line	TABLE 14 - ALL DAIRY AND DUAL PURPOSE CATTLE
				All values are equal to the Whole Farm Share unless indicated otherwise. All summations of line numbers refer to print-out line numbers. A = Herd Total Column; B = Per Cow Column
	1A	1	40	Average Number Adults (Table 12 Line 1A)
	2A	T12	Line 6-8	Sum of Value (Dairy Products Sold + Dairy Products Used in House + Milk Fed to Livestock)
	2B	--	--	L2A ÷ L1A
	3A	T12 T13	9B 1A 2A	[Sum (Net Increase in Value of Cows T12 L9B x Number of Cows T12 L1A) + Net Increase in Value of Other Dairy Cattle T13 L2A]
	3B	--	--	L3A ÷ L1A
	4A	--	--	Sum of items (2A + 3A)
	4B	--	--	Sum of items (2B + 3B)
	5	--	--	PRINT ONLY
	6B	4	1-2 15-16	[Sum of (Dairy Cows + Other Dairy Cattle) for [(Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60) + (Cwt. Protein, Salt & Mineral x 100) + (Tons Complete Ration x 2000) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)]] ÷ L1A
	7B	4	1-2 15-16	[Sum of (Dairy Cows + Other Dairy) for [(Tons Legume Hay x 2000) + (Tons Other Hay x 2000) + (Tons Fodder and Stover x 2000)]] ÷ L1A
	8B	4	15-16	[Sum of (Dairy Cows + Other Dairy) for [(Tons Corn Silage x 2000) + (Tons Grass Silage x 2000)]] ÷ L1A
	9	--	--	PRINT ONLY
	10B	4	1-2 15-16	[Sum of (Dairy Cows + Other Dairy) for (Value of Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Ration + Whole Milk Fed + Skim Milk Fed)] ÷ L1A
	11B	4	1-2 15-16	[Sum of (Dairy Cows + Other Dairy) for Values (Legume Hay + Other Hay + Fodder and Stover) + (Corn Silage + Grass Silage)] ÷ L1A
	12B	4	15-16	[Sum of (Dairy Cows + Other Dairy) for Value of Pasture] ÷ L1A
	13B	--	--	Sum of items (L10B + 11B + 12B)
T8,L5	13A	--	--	L13B x L1A
	14A	--	--	Sum of items (4A minus 13A)
	14B	--	--	Sum of items (4B minus 13B)
	15	--	--	PRINT ONLY
	16B	1	40-41	[Sum of (Dairy Cows + Other Dairy) for Miscellaneous Livestock Expense] ÷ L1A
	17B	1	40-41	[Sum of (Dairy Cows + Other Dairy) for Veterinary Expense] ÷ L1A
	18B	1	40-41	[Sum of (Dairy Cows + Other Dairy) for Custom Work] ÷ L1A
	19B	--	--	Sum of items (16B + 17B + 18B)
	19A	--	--	L20B x L1A
	20A	--	--	Sum of items (14A minus 19A)
	20B	--	--	Sum of items (14B minus 19B)
	21	--	--	PRINT ONLY
T8,L5	22	--	--	(L4A ÷ L13A) x 100
				ALTERNATE METHOD
	6B	T12 T13	15B 4B 7B	[Sum of (Total Concentrates T12 L15B + Concentrates T13 L4B + [Milk T13 L7B ÷ 10])] ÷ L1A
	7B	T12 T13	16B 17B 5B 10B	[Sum of (Legume Hay T12 L16B + Other Hay and Roughage T12 L17B + Hay and Roughage T13 L10B)] ÷ L1A
	8B	T12,13	18B6B	(Sum of Silage T12 L18B + Silage T13 L6B) ÷ L1A
	9	--	--	PRINT ONLY
	10B			Because of category discrepencies, there is no alternative method for feed costs, except for concentrates. To keep this calculation of costs uniform, the alternative for concentrates is not recommended.

Carry To Tble	P-O L	Form	Form Line	TABLE 15A - BEEF BREEDING CATTLE
				All values are equal to the Whole Farm Share unless indicated otherwise. All summations of line numbers refer to print-out numbers. A = Herd Total Column; B = Per Cow Column
	1A	1	42	Average Number of Adults
	2A	1	42	Average Number of Other
	3A	1	3	Sum of Quantity (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Quantity (Beginning Inv + Transferred In + Purchases)
	4B	1	3	[Sum of Value (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Value (Beginning Inv + Transferred In + Purchases)] ÷ L1A
	4A	--	--	L4B x L1A
	5	--	--	PRINT ONLY
	6B	4	3	[Sum of (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60) + (Tons Complete Feed x 2000)] ÷ L1A
	7B	4	3	[Sum of (Cwt. Protein, Salt and Mineral x 100) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)] ÷ L1A
	8B	4	3	(Tons Legume Hay x 2000) ÷ L1A
	9B	4	17	[Sum of (Tons Other Hay x 2000) + (Tons Fodder and Stover x 2000)] ÷ L1A
	10B	4	17	[Sum of (Tons Corn Silage x 2000) + (Tons Grass Silage x 2000)] ÷ L1A
	11	--	--	PRINT ONLY
	12B	4	3	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Feed + Whole Milk Fed + Skim Milk Fed) ÷ L1A
	13B	4	3, 17	Sum of Value (Legume Hay + Other Hay + Fodder and Stover + Corn Silage + Grass Silage) ÷ L1A
	14B	4	17	Value of Pasture ÷ L1A
	15B	--	--	Sum of items (12B + 13B + 14B)
	15A	--	--	L15B x L1A
	16A	--	--	Sum of items (4A minus 15A)
	16B	--	--	Sum of items (4B minus 15B)
	17	--	--	PRINT ONLY
	18B	1	42	Miscellaneous Livestock Expense ÷ L1A
	19B	1	42	Veterinary Expense ÷ L1A
	20B	1	42	Custom Work ÷ L1A
	21B	--	--	Sum of items (18B + 19B + 20B)
	21A	--	--	L21B x L1A
	22A	--	--	Sum of items (16A minus 21A)
	22B	--	--	Sum of items (16B minus 21B)
	23	--	--	PRINT ONLY
	24	--	--	(L4A ÷ L15A) x 100
	25	1	3	(Value Sales ÷ Quantity Sales) x 100
	26	1	3, 42	(Quantity Sales ÷ Number Sales)
	27	1	42	[Sum of (Number Young Died + Number Old Died) ÷ Sum of Number (Beginning Inv+ Purchases + Transferred In + Born)] x 100
	28	--	--	PRINT ONLY (Leave column blank)

Carry To Tble	P-O L	Form	Form Line	TABLE 15B - FEEDER CATTLE
				All values are equal to the Whole Farm Share. All summations of line numbers refer to print-out numbers. A = Herd Total Column; B = Per Cwt. Column
	1A	1	43	Sum of (Average Number Adults + Average Number Other)
	2A	1	4	Sum of Quantities (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Quantity (Beginning Inv + Transferred In + Purchases)
				L2A ÷ 100 = Cwt*
	3A	1	4	Sum of Value (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Value (Beginning Inv + Transferred In + Purchases)
	3B	--	--	L3A ÷ Cwt*
	4	--	--	PRINT ONLY
	5B	4	4	[Sum of (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60) + (Tons Complete Ration x 2000)] ÷ Cwt*
	6B	4	4	[Sum of (Cwt. Protein, Salt & Mineral x 100) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)] ÷ Cwt*
	7B	4	4	(Tons Legume Hay x 2000) ÷ Cwt*
	8B	4	18	[Sum of (Tons Other Hay x 2000) + (Tons Fodder and Stover x 2000)] ÷ Cwt *
	9B	4	18	[Sum of (Tons Corn Silage x 2000) + (Tons Grass Silage x 2000)] ÷ Cwt*
	10	--	--	PRINT ONLY
	11B	4	4	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt and Minera + Complete Ration + Whole Milk Fed + Skim Milk Fed) ÷ Cwt*
	12B	4	4, 18	Sum of Value (Legume Hay + Other Hay + Corn Silage + Grass Silage + Fodder a Stover) ÷ Cwt*
	13B	4	18	Value of Pasture ÷ Cwt*
	14B	--	--	Sum of items (11B + 12B + 13B)
	14A	--	--	L14B x Cwt*
	15A	--	--	Sum of items (3A minus 14A)
	15B	--	--	Sum of items (3B minus 14B)
	16	--	--	PRINT ONLY
	17B	1	43	Miscellaneous Livestock Expense ÷ Cwt*
	18B	1	43	Veterinary Expense ÷ Cwt*
	19B	1	43	Custom Work ÷ Cwt*
	20B	--	--	Sum of items (17B + 18B + 19B)
	20A	--	--	L20B x Cwt*
	21A	--	--	Sum of items (15A minus 20A)
	21B	--	--	Sum of items (15B minus 20B)
	22	--	--	PRINT ONLY
	23	--	--	(L 3A ÷ L14A) x 100
	24	1	4	(Value Sales ÷ Quantity Sales) x 100
	25	1	4, 43	(Quantity Sales ÷ Number Sales)
	26	1	4	(Value Purchases ÷ Quantity Purchases) x 100
	27	1	4, 43	Quantity Purchases ÷ Number Bought
	28	1	43	Number Purchased
	29	1	43	[Sum (Number Old Died + Number Young Died) ÷ Sum (Number Beginning Inv + N Purchased + Number Transferred In + Number Born)] x 100

Carry To Tble	P-O L	Form	Form Line	TABLE 16A - SHEEP FLOCK
				All values are equal to the Whole Farm Share. All summations of line numbers refer to print-out numbers. A = Flock Total Column; B = Per Ewe Column
	1A	1	47	Average Number Adults
	2A	1	8	Sum of Quantity (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Quantity (Beginning Inv + Transferred In + Purchases)
	3A	1	34	Quantity Wool Sold - Farm Flock
	4	--	--	PRINT ONLY
	5B	1	34-35	Sum of Value (Wool Sold - Farm Flock + Incentive Payment - Farm Flock) ÷ L1A
	6B	1	8	[Sum of Value (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Value (Beginning Inv + Transferred In + Purchases)] ÷ L1A
	7B	--	--	Sum of items (5B + 6B)
	7A	--	--	L7B x L1A
	8	--	--	PRINT ONLY
	9B	4	8	[Sum (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60) + (Tons Complete Feed x 2000)] ÷ L1A
	10B	4	8	[Sum of (Cwt Protein, Salt and Mineral x 100) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)] ÷ L1A
	11B	4	8	(Tons Legume Hay x 2000) ÷ L1A
	12B	4	22	[Sum of (Tons Other Hay x 2000) + (Tons Fodder and Stover x 2000)] ÷ L1A
	13B	4	22	[Sum of (Tons Corn Silage x 2000) + (Tons Grass Silage x 2000)] ÷ L1A
	14	--	--	PRINT ONLY
	15B	4	8	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Rations + Whole Milk Fed + Skim Milk Fed) ÷ L1A
	16B	4	8, 22	Sum of Value (Legume Hay + Other Hay + Corn Silage + Grass Silage + Fodder and Stover) ÷ L1A
	17B	4	22	Value of Pasture ÷ L1A
	18B	--	--	Sum of items (15B + 16B + 17B)
	18A	--	--	L18B x L1A
	19A	--	--	Sum of items (7A minus 18A)
	19B	--	--	Sum of items (7B minus 18B)
	20	--	--	PRINT ONLY
	21B	1	47	Miscellaneous Livestock Expense ÷ L1A
	22B	1	47	Veterinary Expense ÷ L1A
	23B	1	47	Custom Work Hired ÷ L1A
	24B	--	--	Sum of items (21B + 22B + 23B)
	24A	--	--	L24B x L1A
	25A	--	--	Sum of items (19A minus 24A)
	25B	--	--	Sum of items (19B minus 24B)
	26	--	--	PRINT ONLY
	27	--	--	(L7A ÷ L18A) x 100
	28	1	8	(Value Sales ÷ Quantity Sales) x 100
	29	1	33,34	Pounds Wool Sold - Farm Flock ÷ Number Sheared - Farm Flock
	30	1	47	Number of Females Bearing
	31	1	47	Number Born ÷ Females Bearing
	32	1	47	[Sum of (Number Young Died + Number Old Died) ÷ Sum of (Number at Beginning Inv + Number Purchases + Number Transferred In + Number Born)] x 100

Carry To Tble	P-O L	Form	Form Line	TABLE 16B - FEEDER LAMBS
				All values are equal to the Whole Farm Share. All summations of line numbers refer to print-out numbers. A = Flock Total Column; B = Per Cwt. Column
	1A	1	48	Average Number Other
	2A	1	9	Sum of Quantity (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Quantity (Beginning Inv + Transferred In + Purchases)
				L2A ÷ 100 = Cwt.*
	3A	1	34a	Feeder Lambs: wool sold, quantity
	4	--	--	PRINT ONLY
	5B	1	34a,35a	Feeder Lambs (Wool sold, value + Incentive payment, value)
	6B	1	9	Sum of Value [(Ending Inventory + Transferred Out + Butchered + Sales) minus sum of value (Beginning Inventory + Transferred in + Purchases)] ÷ Cwt*
	7B			Sum of (5B + 6B)
	7A			7B x Cwt*
	8			PRINT ONLY
	9B	4	9	[Sum of (Bushels Corn x 56) + (Bushels Oats x 32) +(Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60) + (Tons Complete Feed x 2000)] ÷ Cwt*
	10B	4	9,23	[Sum of (Cwt. Protein, Salt & Mineral x 100) + (Pounds Whole Milk ÷ 10) + (Pounds Skim Milk ÷ 10)] ÷ Cwt*
	11B	4	9	(Tons Legume Hay x 2000) ÷ Cwt*
	12B	4	23	[Sum of (Tons Other Hay x 2000) + (Tons Fodder and Stover x 2000)] ÷ Cwt*
	13B	4	23	[Sum of (Tons Corn Silage x 2000) + (Tons Grass Silage x 2000)] ÷ Cwt*
	14	--	--	PRINT ONLY
	15B	4	9,23	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Feed + Whole Milk Fed + Skim Milk Fed) ÷ Cwt*
	16B	4	9,23	Sum of Value (Legume Hay + Other Hay + Corn Silage + Grass Silage + Fodder a Stover) ÷ Cwt*
	17B	4	23	Value of Pasture ÷ Cwt*
	18B	--	--	Sum of items (15B + 16B + 17B)
T8,L5	18A	--	--	L18B x Cwt*
	19A	--	--	(7A minus 18A)
	19B	--	--	(7B minus 18B)
	20	--	--	PRINT ONLY
	21B	1	48	Miscellaneous Livestock Expense ÷ Cwt*
	22B	1	48	Veterinary Expense ÷ Cwt*
	23B	1	48	Custom Work ÷ Cwt*
	24B	--	--	Sum of items (21B + 22B + 23B)
	24A	--	--	L24B x Cwt*
	25A	--	--	(19A minus 24A)
	25B	--	--	(19B minus 24B)
	26	--	--	PRINT ONLY
T8,L5	27	--	--	(L7A ÷ L18A) x 100
	28	1	9	(Value Sales ÷ Quantity Sales) x 100
	29	1	34a,33a	Pounds of Wool Sold, Feeder Lambs ÷ number sheared, Feeder Lambs
	30	1	9,48	Quantity Sales ÷ Number Sold
	31	1	9	(Value Purchases ÷ Quantity Purchased) x 100
	32	1	9,48	Quantity Purchases ÷ Number Purchased
	33	1	48	[Number Other Died ÷ Sum of Number (Beginning Inv + Purchases + Transferred In + Born)] x 100

Carry To Tble	P-O L	Form	Form Line	TABLE 17A - LAYING FLOCK--CHICKENS
				All values are equal to the Whole Farm Share All summations of line numbers refer to print-out numbers. A = Flock Total Column; B = Per Hen Column
	1A	1	49	Average Number Adults
	2	--	--	PRINT ONLY
	3B	1	36, 38	Sum of Value (Chicken Eggs Sold + Eggs Used in House) ÷ L1A
	4B	1	10	[Sum of Value (Ending Inv + Butchered + Sales) minus Sum of Value (Beginning Inv + Transferred In + Purchases)] ÷ L1A
	5B	--	--	Sum of items (3B + 4B)
	5A	--	--	L5B x L1A
	6	---	--	PRINT ONLY
	7B	4	10	[Sum of (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60)] ÷ L1A
	8B	4	10	(Cwt. Protein, Salt & Mineral x 100) ÷ L1A
	9B	4	10	(Tons Complete Ration x 2000) ÷ L1A
	10B	--	--	Sum of items (7B + 8B + 9B)
	11B	4	10	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Feed) ÷ L1A
	11A	--	--	L11B x L1A
	12A	--	--	Sum of items (5A minus 11A)
	12B	--	--	Sum of items (5B minus 11B)
	13B	1	49	Sum of (Miscellaneous Livestock Expense + Veterinary Expense + Custom Work) ÷ L1A
	13A	--	--	L13B x L1A
	14A	--	--	Sum of items (12A minus 13A)
	14B	--	--	Sum of items (12B minus 13B)
	15	--	--	PRINT ONLY
	16	--	--	(L5A ÷ L11A) x 100
	17	1	36, 38	[Sum of Quantity (Eggs Sold + Eggs Used in House) x 12] ÷ L1A
	18	1	36	Value Eggs Sold ÷ Quantity Eggs Sold
	19	1	36,38	Feed Costs L11A ÷ Sum of Quantity (Eggs Sold + Eggs Used in House)
	20	--	--	[Total Value Produced L5A ÷ Sum of Quantity (Eggs Sold + Eggs Used in House)] minus (Feed Cost/Dozen Eggs)
	21	1	49	[Sum of (Number Young Died + Number Old Died) ÷ Sum of (Number Beginning Inv + Number Purchased + Number Transferred In)] x 100

Carry To Tble	P-O L	Form	Form Line	TABLE 17B - BROILERS
				All values are equal to the Whole Farm Share. All summations of line numbers refer to print-out numbers. A = Flock Total Column; B = Per Cwt. Column
	1A	1	11	Sum of Quantity (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Quantity (Beginning Inv + Purchases)
				L1A ÷ 100 = Cwt*
	2B	1	11	Sum of Value (Ending Inv + Transferred Out + Butchered + Sales) minus Sum of Value (Beginning Inv + Purchases) ÷ Cwt*
	2A	--	--	L2B x Cwt*
	3	--	--	PRINT ONLY
	4B	4	11	[Sum of Quantity (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60)] ÷ Cwt*
	5B	4	11	(Cwt. Protein, Salt & Mineral x 100) ÷ Cwt*
	6B	4	11	(Tons Complete Feed x 2000) ÷ Cwt*
	7B	--	--	Sum of items (4B + 5B + 6B)
	8B	4	11	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Feed) ÷ Cwt*
	8A	--	--	L8B x Cwt*
	9A	--	--	Sum of items (2A minus 8A)
	9B	--	--	Sum of items (2B minus 8B)
	10B	1	50	Sum of (Miscellaneous Livestock Expense + Veterinary Expense + Custom Work) ÷ Cwt*
	10A	--	--	L10B x Cwt*
	11A	--	--	Sum of items (9A minus 10A)
	11B	--	--	Sum of items (9B minus 10B)
	12	--	--	PRINT ONLY
	13	--	--	(L2A ÷ L8A) x 100
	14	1	50	Number Purchased
	15	1	11, 50	Value Purchased ÷ Number Purchased
	16	1	50	Number Young Died ÷ Sum of (Number Beginning Inv + Number Purchased)
	17	--	--	[Total Feed Costs L8A ÷(Total Pounds of Feed L7B x Cwt*)] x 100
	18	1	11	Value Sales ÷ Quantity Sales
	19	1	11, 50	Quantity Sales ÷ Number Sales

Carry To Tble	P-O L	Form	Form Line	TABLE 18A - TURKEYS--LAYING FLOCK
				All values are equal to the Whole Farm Share All summations of line numbers refer to print-out numbers. A = Flock Total Column; B = Per Hen Column
	1A	1	51	Average Number Adults
	2	--	--	PRINT ONLY
	3B	1	37,38	Sum of Value (Turkey Eggs Sold + Eggs Used in House) ÷ L1A
	4B	1	12	[Sum of Value (Ending Inv + Butchered + Sales) minus Sum of Value (Beginning Inv + Transferred In + Purchases)] ÷ L1A
	5B	--	--	Sum of items (3B + 4B)
	5A	--	--	L5B x L1A
	6	--	--	PRINT ONLY
	7B	4	12	[Sum of (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barley x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60)] ÷ L1A
	8B	4	12	(Cwt. Protein, Salt & Mineral x 100) ÷ L1A
	9B	4	12	(Tons Complete Ration x 2000) ÷ L1A
	10B	--	--	Sum of items (7B + 8B + 9B)
	11B	4	12	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt & Mineral + Complete Feed) ÷ L1A
	11A	--	--	L11B x L1A
	12A	--	--	Sum of items (5A minus 11A)
	12B	--	--	Sum of items (5B minus 11B)
	13B	1	51	Sum of (Miscellaneous Livestock Expense + Veterinary Expense + Custom Work) ÷ L1A
	13A	--	--	L13B x L1A
	14A	--	--	Sum of items (12A minus 13A)
	14B	--	--	Sum of items (12B minus 13B)
	15	--	--	PRINT ONLY
	16	--	--	(L5A ÷ L11A) x 100
	17	1	37,38	[Sum of Quantity (Eggs Sold + Eggs Used in House) x 12] ÷ L1A
	18	1	37	Value Eggs Sold ÷ Quantity Eggs Sold
	19	1	37,38	Feed Costs L11A ÷ Sum of Quantity (Eggs Sold + Eggs Used in House)
	20			[Total Value Produced L5A ÷ Sum of Quantity (Eggs Sold + Eggs Used in House)] minus (Feed Cost/Dozen Eggs)
	21	1	51	[Sum of (Number Young Died + Number Old Died) ÷ Sum of (Number Beginning Inv + Number Purchased + Number Transferred In)] x 100

Carry To Tble	P-O L	Form	Form Line	TABLE 18B - TURKEY POULTS
				All values are equal to the Whole Farm Share. All summations of line numbers refer to print-out numbers. A = Flock Total Column; B = Per Cwt. Column
	1A	1	13	Sum of Quantity (Ending Inv + Transferred Out + Butchered + Sales) minus Sur of Quantity (Beginning Inv + Purchases)
				L1A ÷ 100 = Cwt*
	2B	1	13	Sum of Value (Ending Inv + Tranferred Out + Butchered + Sales) minus Sum of Value (Beginning Inv + Purchases) ÷ Cwt*
	2A	--	--	L2B x Cwt*
	3	--	--	PRINT ONLY
	4B	4	13	[Sum of Quantities (Bushels Corn x 56) + (Bushels Oats x 32) + (Bushels Barl x 48) + (Bushels Rye x 56) + (Bushels Wheat x 60)] ÷ Cwt*
	5B	4	13	(Cwt. Protein, Salt and Mineral x 100) ÷ Cwt*
	6B	4	13	(Tons Complete Feed x 2000) ÷ Cwt*
	7B	--	--	Sum of items (4B + 5B + 6B)
	8B	4	13	Sum of Value (Corn + Oats + Barley + Rye + Wheat + Protein, Salt and Mineral + Complete Feed) ÷ Cwt*
	8A	--	--	L8B x Cwt*
	9A	--	--	Sum of items (2A minus 8A)
	9B	--	--	Sum of items (2B minus 8B)
	10B	1	52	Sum of (Miscellaneous Livestock Expense + Veterinary Expense + Custom Work) ÷ Cwt*
	10A	--	--	L10B x Cwt*
	11A	--	--	Sum of items (9A minus 10A)
	11B	--	--	Sum of items (9B minus 10B)
	12	--	--	PRINT ONLY
	13	--	--	(L2A ÷ L8A) x 100
	14	1	52	Number Purchased
	15	1	13, 52	Value Purchased ÷ Number Purchased
	16	1	52	Number Young Died ÷ Sum of (Number Beginning Inv + Number Purchased)
	17	--	--	[Total Feed Cost L8A ÷ (Total Pounds Feed L7B x Cwt*)] x 100
	18	1	13	Value Sales ÷ Quantity Sales
	19	1	13, 52	Quantity Sales ÷ Number Sales

TESTING THE DOCUMENTATION

To insure that the instructions for making the business analysis were correct, four test cases were devised for inputting data. Choosing figures at random, the four computer data forms were completed. On the initial test case, every blank space on the data form was completed. The test cases, along with the initial draft of the documentation were sent to Del Hodgkins, Area Coordinator at the Mankato Area Vocational Technical School. Following the instructions in the documentation, Mr. Hodgkins completed the analysis of the test records. Several errors in the instructions were detected and corrected.

When the staff was satisfied that the instructions were correct, they were delivered to Agricultural Records Cooperative, Madison, Wisconsin, to be used as the basis for computer programming. Because the changes in format for output and input were so drastically different from the original material developed at ARC for this purpose, they chose to scrap their previous work and begin anew. To facilitate the orderly development of the program, they first devised a flow chart of the various inputs and functions. Flow charts were prepared for the analysis of records, compiling averages of records and making corrections. The extremely competent work of the proramming staff produced the desired program in record time with a minimum of error. It was primarily due to this demonstrated ability to perform a task so competently that ARC was chosen as the collaborator in the experimental forms of record keeping reported later in this document.

The flow charts which indicate the development process follow.

The revised farm business analysis has been used to analyze more than 3500 farm business records. The program as described and supported by the documentation has been made available to all organized management education groups who have adopted a business management approach to adult education. For the 1969 calendar year, the Agriculture Records Cooperative, Madison, Wisconsin, processed farm record analyses for the States of Minnesota, Washington, South Dakota, Nebraska, Alaska, Connecticut, and for individual teachers in Iowa, Wisconsin, and North Dakota.

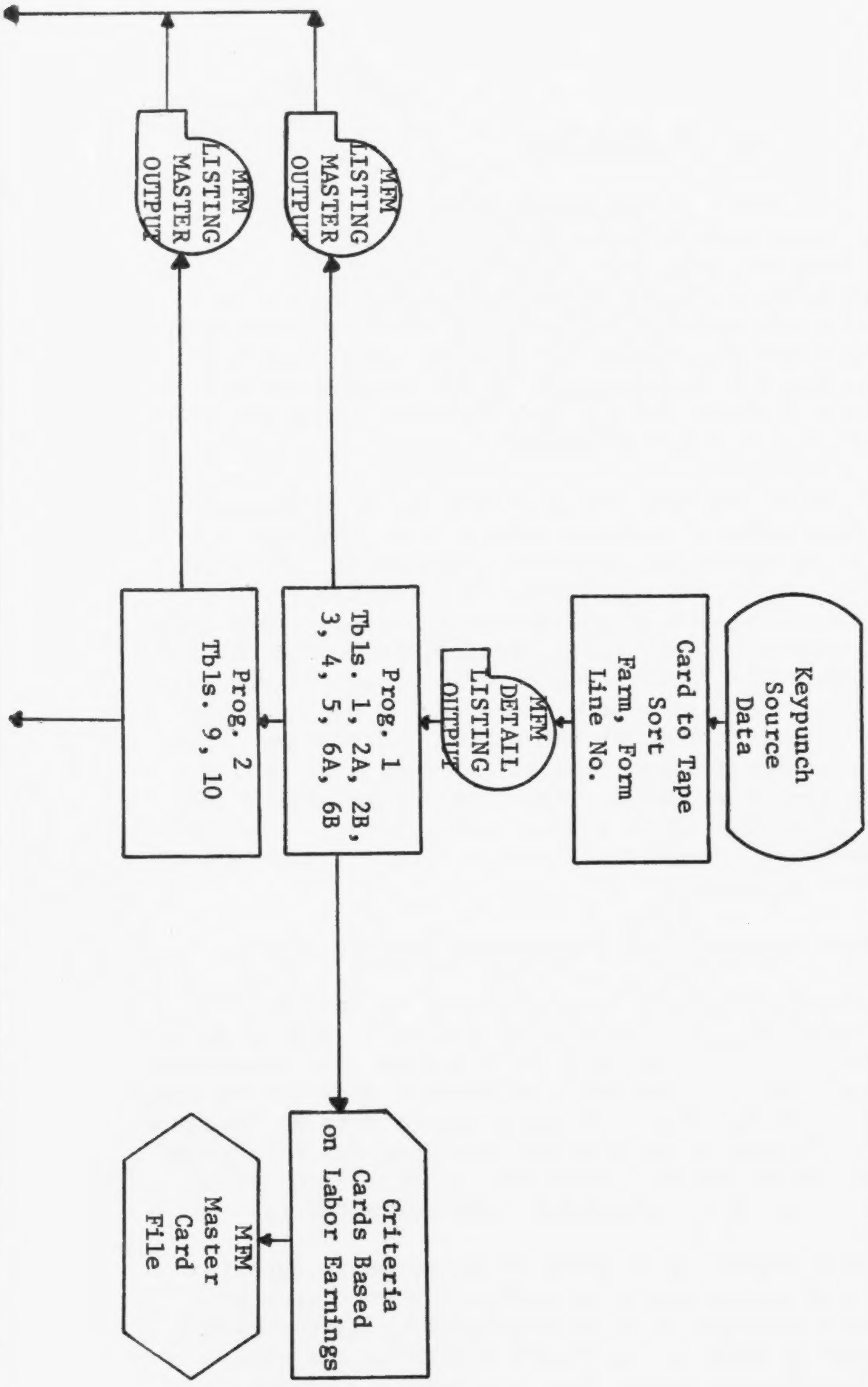
It is anticipated that expanded programs of management education will continue to demand the record analysis services this system provides. For 1970, expanded programs will be developed in North Dakota, Iowa, Nebraska, and Oregon as well as continued growth in the other states already with an established adult farm management approach to agricultural education.

The addition of a crop analysis to the system has sparked interest among educators in devising ways of using the information in classroom

DIAGRAMMING AND CHARTING WORKSHEET

MINNESOTA FARM MANAGEMENT
INITIAL PROCEDURE

Page 1 of 6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MFM LISTING MASTER OUTPUT
Prog. 2 Tbls. 9, 10
MFM LISTING MASTER OUTPUT
Criteria Cards Based on Labor Earnings
MFM Master Card File

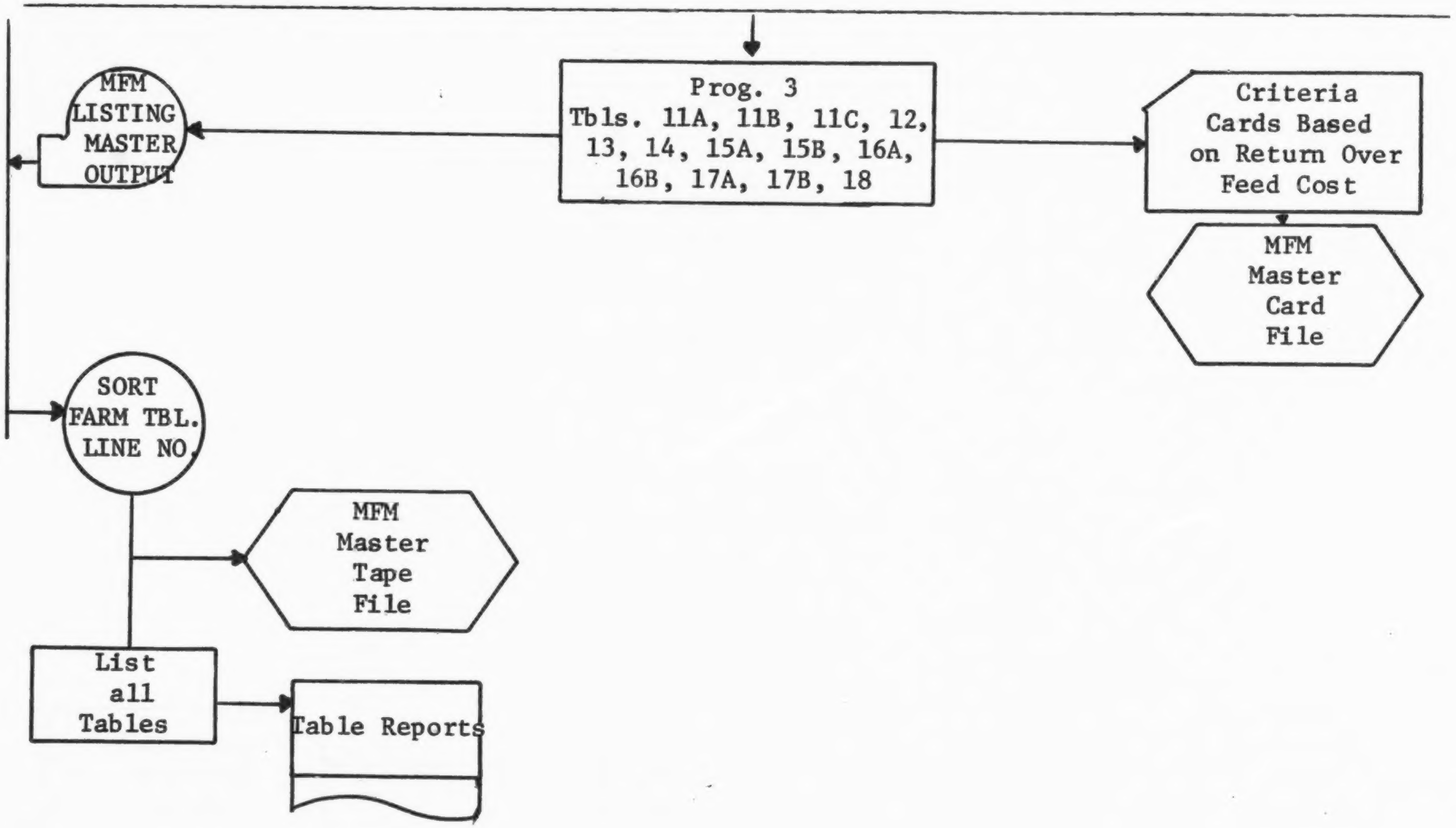
Exhibit D - Diagramming and Charting

Worksheets - Computer Analysis

DIAGRAMMING AND CHARTING WORKSHEET

MINNESOTA FARM MANAGEMENT
INITIAL PROCEDURE

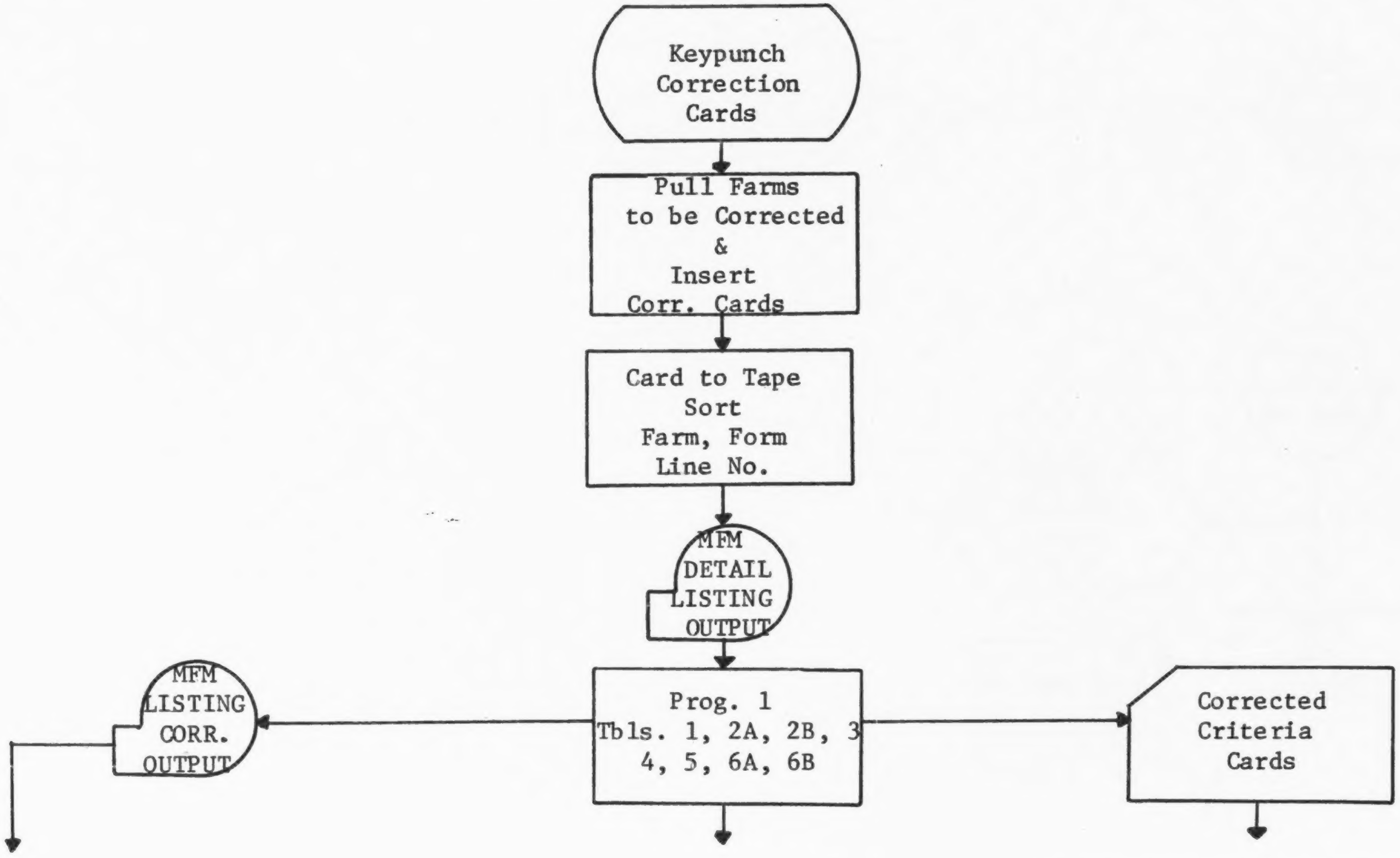
Page 2 of 6


Prog. 3
Tbls. 11A, 11B, 11C, 12, 13, 14, 15A, 15B, 16A, 16B, 17A, 17B, 18
MFM LISTING MASTER OUTPUT
Criteria Cards Based on Return Over Feed Cost
MFM Master Card File
SORT FARM TBL. LINE NO.
MFM Master Tape File
List all Tables
Table Reports

DIAGRAMMING AND CHARTING WORKSHEET

MINNESOTA FARM MANAGEMENT
CORRECTION PROCEDURE

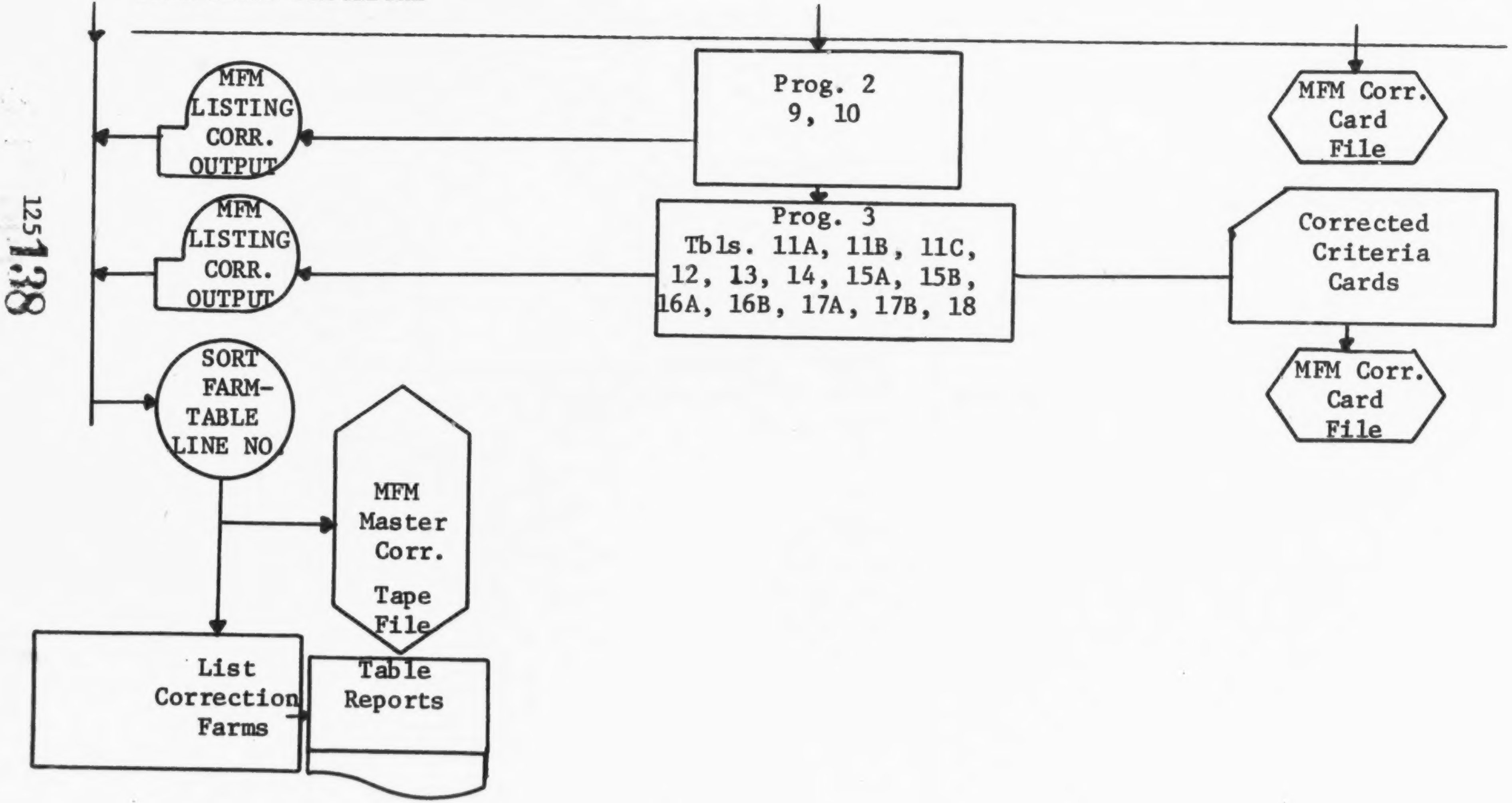
Page 3 of 6


Keypunch Correction Cards
Pull Farms to be Corrected & Insert Corr. Cards
Card to Tape Sort Farm, Form Line No.
MFM DETAIL LISTING OUTPUT
Prog. 1 Tbls. 1, 2A, 2B, 3 4, 5, 6A, 6B
MFM LISTING CORR. OUTPUT
Corrected Criteria Cards

DIAGRAMMING AND CHARTING WORKSHEET

MINNESOTA FARM MANAGEMENT
CORRECTION PROCEDURE

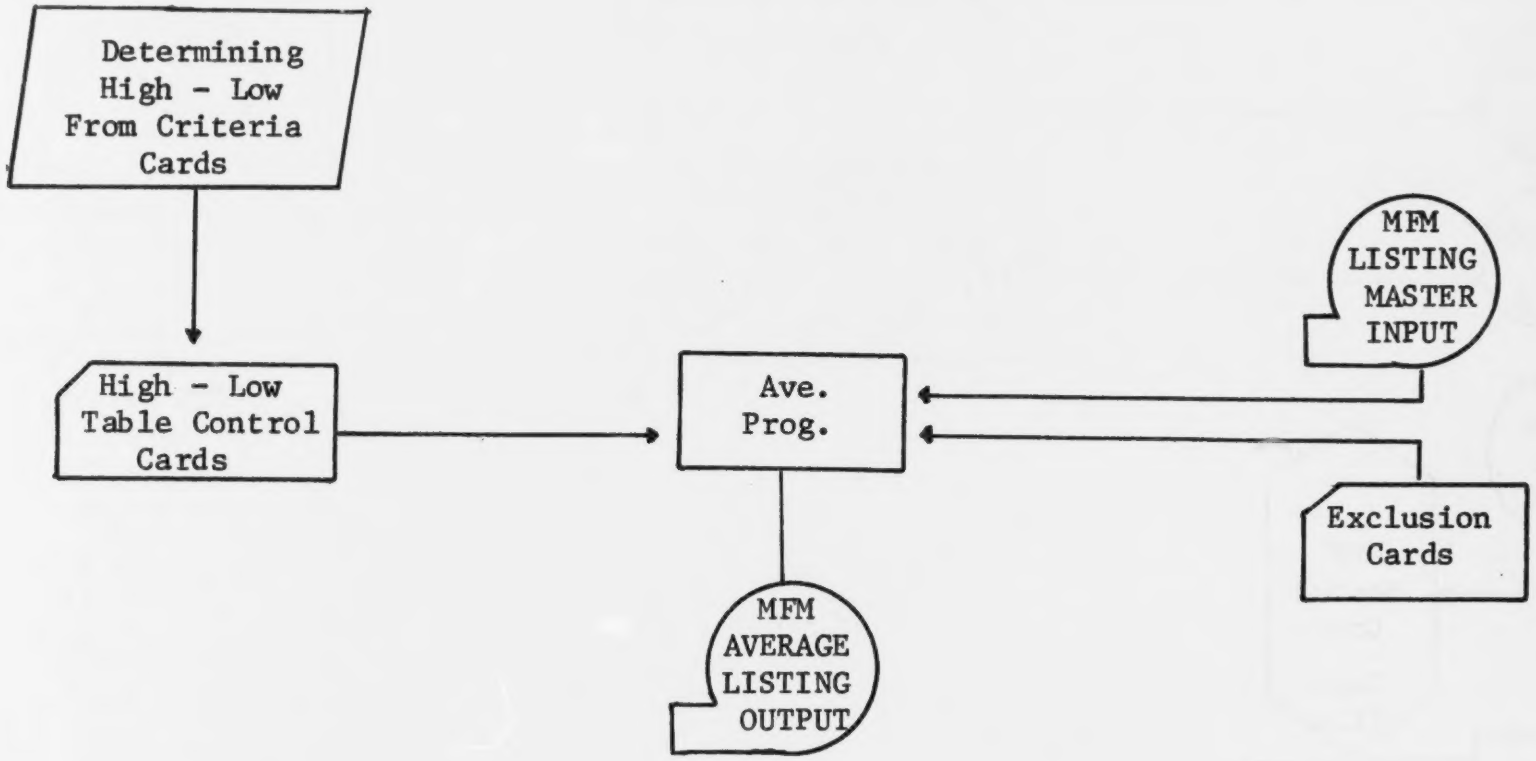
Page 4 of 6



DIAGRAMMING AND CHARTING WORKSHEET

MINNESOTA FARM MANAGEMENT
AVERAGING PROCEDURE

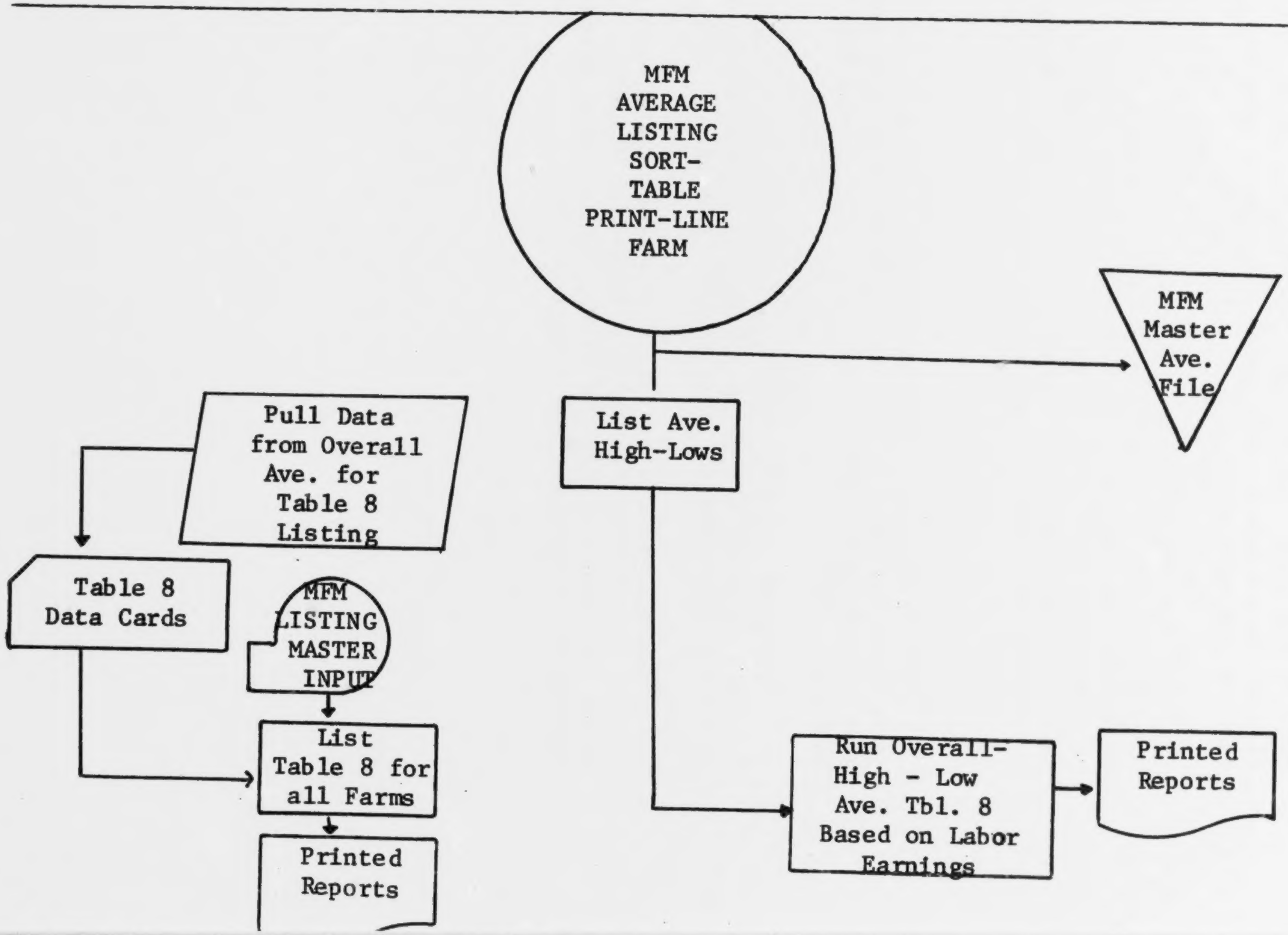
Page 5 of 6



DIAGRAMMING AND CHARTING WORKSHEET

MINNESOTA FARM MANAGEMENT
AVERAGING PROCEDURE

Page 6 of 6



and individual instruction. Several have organized projects to test the accuracy of the allocation process used in these parts of the business analysis.[1,2,3] The general conclusion is that the allocation process is sufficiently accurate to warrant its continued use in the business analysis. The additional accuracy that may be obtained by other methods of accounting are generally not worth the time and effort required to collect the data. While some improvements still must be made in the allocation procedure, the current system is generally considered satisfactory for most farms.

The revised analysis system has been adequately tested by farmers and educators. It forms the basis for determining the specific kinds of inputs required in a mail in form of records if the analysis is to be compatible with that obtained through the use of an account book. It was with this analysis in mind that the mail in accounts described in subsequent sections of this report were devised and tested.

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[1] Lehto, Dennis. "Development and Evaluation of a System of Enterprise Cost Analysis to be Used in an Instructional Farm Management Program," Unpublished Masters paper, U. of M., Department of Agricultural Education, 1969.

[2] Carlson, Arnold. "Machine Costs and Field Labor Requirements for Specific Crops in the Wells, Minnesota Area," Unpublished Maters paper, U. of M., Department of Agricultural Education, 1970.

[3] Hansen, Willard E. "An Evaluation of the Allocation of Machinery Expense to the 1968 Crop by the Work Unit Method as Compared to the Estimated Cost Based on Machine Usage," Unpublished Research Paper, U. of M., Department of Agricultural Education, 1968.

CHAPTER V

DESIGN FOR DEVELOPMENT OF A PILOT STUDY IN ELECTRONIC FARM RECORD KEEPING

Development and evaluation of prototype systems of electronic farm record keeping evolved as one of the major problems of this study. While these two phases, development and evaluation, were not distinctly separate operations, the processes and mechanisms of evaluation are considered later. The developmental activities and procedures are presented here.

Operational Units

An objective of the developmental phase of the study was to provide an opportunity for farmers, instructors, area agriculture coordinators, electronic farm records personnel, and research personnel to work together to ascertain the feasibility of applying computer innovations to the farm business management instruction program. Three operational units were defined: the local cooperator units (instructors and farm families), the electronic farm record service, and the Project Center.

Local Cooperator Units. Theory suggested a sample be selected on a randomization or stratified basis. Practically, this was not possible. The study would utilize confidential financial data and would provide the information for such personal things as filing tax statements and securing credit. Farm families who were not opposed to a third party handling their financial records and who were willing to accept the potential risk of an experimental, developmental project were sought.

Original contact was made with the vocational agriculture instructors. In July of 1968, a brief questionnaire was mailed to all vocational agriculture departments with instructors specifically assigned to adult education. In addition to seeking information on the interest of instructors in contributing to projects in specific areas of farm business management instruction, two questions relevant to this study were asked. The instructor was asked whether or not he had three farm management cooperators who might be interested in participating in an experimental record project during the 1969 calendar year. He was also asked if he would be interested in helping to supervise the experimental record system. Based upon the strength of this response, other developmental procedures were initiated.

In October, a follow-up communication was sent to all adult vocational agriculture program instructors. The purpose of the study, the function of the various cooperating persons, the criteria for selecting cooperators, the financial obligation of the study participants, and the output information expected were briefly described. The instructors were asked to indicate if they had at least three cooperators who would participate and also, if these cooperators would be interested in participating in a test run of the experimental systems.

To control variability among cooperators, each agriculture instructor was requested to select three of his cooperators who met four criteria. The criteria were:

1. The farmer must be willing to cooperate and be resceptive to instruction for completing the required forms for the assigned record system.
2. The farmer must have completed at least three years of record keeping and business analysis through an area analysis center as of January 1, 1969. He must have a thorough knowledge of the reasons for keeping farm records and securing an analysis of his farm business. He must have demonstrated his ability to keep accurate accounts.
3. The farmer must be regularly enrolled in a farm business management program and must pay the regular analysis fee for his area.
4. The farmer must be willing to supply other items of information about time required, ease of recording and problems that occur with the record system assigned to him.

The first criterion was relaxed at the request of the intructors. Many of them indicated their farmers would not cooperate if they did not have the opportunity to select the prototype system they would be using.

The criteria for selecting vocational agriculture instructors were basic. They had to have indicated an interest in the developmental study; they had to have three interested cooperators who met the selection criteria; and they had to be full-time adult instructors or be specifically assigned to the farm management program. Their responsibilities were to work with the cooperators as regular farm business management students plus assist them in interpreting and using the new record system. They also were to aid in evaluating the systems and to offer suggestions for improving them.

The responsibilities of the cooperating farm families were partially defined by selection criterion. In addition, one cooperator was designated as a control. His major responsibility was to maintain his normal farm business record in an approved account book and to provide data on the amount of time he spent keeping his record. The other two cooperators were to use the prototype system of record keeping assigned or requested, provide time data and cooperate in evaluating the system they were using.

Twenty six local cooperator units composed of an instructor and three cooperating farm families, were selected. All analysis areas were represented. See Figure 2.

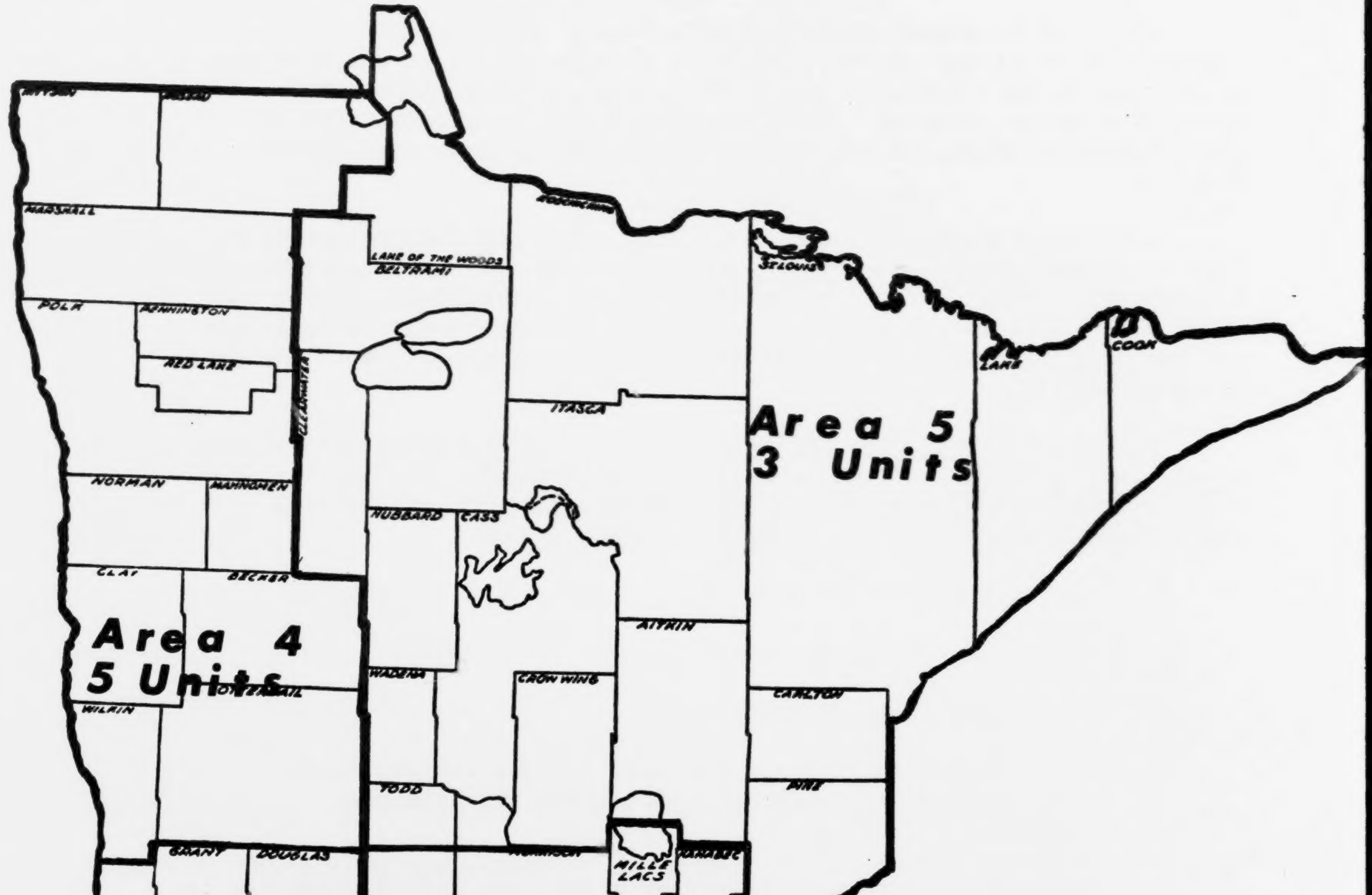

FIGURE 2. LOCAL COOPERATOR UNITS REPRESENTED ALL RECORD ANALYSIS AREAS.

It should be pointed out that this sample of cooperators was not representative of the average Minnesota farmer. These cooperators were interested in farm business management education as evidenced by their enrollment in the program. They were interested in working with an experimental program and they were experienced and competent record keepers.

Unfortunagely, it became obvious that a few instructors intentionally or unintentionally contacted cooperators of, at best, average record keeping proficiency and questionable interest. Since there was no way to measure the aptitude or interest of the cooperators a priori, it was not possible to screen these individuals from the sample before the project began.

Electronic Farm Record Service. The cost of designing and programming an electronic farm record keeping service made it uneconomical to develop completely new systems. A search was made for an existing service which would meet the following criteria:

1. Provide monthly cash flow and enterprise information.

2. Provide capital asset (depreciation) information.

3. Provide tax planning information.

4. Provide the farm business analysis information available in the Minnesota Vocational Agriculture Farm Business Analysis.

Criteria number four was affected by a decision not to sacrifice information provided by the Minnesota Vocational Agriculture Farm Business Analysis. No operational system which was economically assessible satisfied this restriction. A review of the available electronic farm record systems did not reveal a system which would not need modification or supplementation. Thus, while it was still considered necessary to maintain the above mentioned criteria, other considerations became important. The eminent problem was to identify the electronic farm record service which could most efficiently meet the established criteria. Since the regular electronic analysis of the account book was being done by Agricultural Records Cooperative in Madison, Wisconsin, this cooperative had the program and the accompanying expertise to meet criterion number four, the major restriction facing other services. Agricultural Records Cooperative also had:

1. An operational monthly electronic farm records program which satisfied the first three criteria.

2. Personnel with demonstrated efficiency in farm accounting and record analysis.

3. Personnel interested in developmental programs.

Agricultural Records Cooperative personnel were approached to determine their willingness to work with the study. Their task was to provide the monthly program mechanism and to assist in combining this monthly program data with supplementary data to yield the standard Minnesota Vocational Agriculture Farm Business Analysis. They were willing to accept this job.

Project Center. The operational nerve center for the study was the Project Center. It was located in the University of Minnesota Department of Agricultural Ecucation and operated by the study personnel. The Project Center filled the role of a monitor between the local cooperator units and the electronic farm record Service. As an extension of the electronic farm record service, the Project Center duplicated all computer center functions to the point of keypunching data. Further, the Project Center staff reviewed the monthly printout before it was returned to the farmer. This procedure allowed the study personnel to learn the operational details of the input mechanism. The Project Center also provided a safety factor by maintaining an account book for the experimental record system cooperators.

Prototype Systems

Since most electronic farm record systems utilized either monthly reporting forms or a check related instrument for inputing data, a prototype system of each type was designed for the study. They are referred to in this report as the monthly system and the check system.

Monthly System Input. The monthly protosystem used Agricultural Records Cooperative's electronic farm records forms. The Monthly Receipts and Losses form (Appendix A, page 220) was used to report income and losses. It is divided into three sections. The top section was used to report all regular income both personal and farm, including the sales of raised dairy and breeding stock. The middle section was used to report the sale of purchased dairy or breeding animals. The bottom section of the form was used to report animals held for resale.

Regular expenses were reported on Monthly Expense forms (Appendix A, page 223). The cooperator simply reported date; enterprise; item description; quantity-unit; dollars paid; percent landlord's and person paid.

Purchases of capital asset item were reported on the Monthly Capital Asset Transactions Depreciation Schedule Items forms (Appendix A, page 225).

Modifications in Input Procedures. Only two major modifications were made in the normal entry procedure for the input form. The cooperators were instructed to report charged items when they were acquired. They were told to identify these items by writing charged in the column entitled "person paid." Since the electronic farm record program did not call for an automatic accumulation of these charges, this function was assumed as the Project Center. Charged items were totaled mechanically and the appropriate accounts payable enterprise entries were made.

The second modification was in the procedure for reporting purchased animals held for resale. For tax related reasons, the purchase information for these animals was normally not reported at the time of purchase. It was instead entered in a feeder log (Appendix D, page 281) which the farmer maintained. To avoid the noticeable discrepancy in cash flow caused by the purchase of feeder livestock, the cooperators were instructed to report such purchases as they occurred. The Project Center then completed the feeder log, but also circled the purchase entry on the expense form which changed it to a non-cash expense. (The edit system would not allow a cash expense for this type of entry, and while non-cash was not the correct identification, the monthly enterprise summary was more realistic.) At the time of sales, it was necessary to calculate purchase weight and purchase cost and to enter these on the receipt form. The first-in, first-out method was used. This procedure would have resulted in a double charge, cash and non-cash, so the non-cash entry was reduced by the appropriate amount.

Check System Input. A check voucher system was designed to eliminate the necessity of going through a number of bank systems to establish account numbers. The voucher had the added advantage of allowing more adequate space for transaction description compared to reporting on a check. The check voucher (Appendix B, page 243) was used to report the detailed transaction information for receipts, expenses and asset purchases. Voucher pads were designed for use in a two pad check book. They replace the balance sheet pad. On the upper half of the voucher, space is provided to record normal check record information: check number, date, to whom, dollar amount, deposit amount, and past balance and current balance. The lower section had a format similar to the Monthly Expense forms. While the format was simple, the cooperator still had to report all essential information. For example, the sale of a dairy cow required the farmer to complete a regular description and also indicate whether purchased or raised, if held less than 12 months, if lost, purchase cost, and asset number. The farmer had to remember to report the essential information without a specific reporting format to remind him of the information needed.

Although in theory cash transactions are to be avoided with a check record mechanism, they do occur and must be reported. A Miscellaneous Monthly Transactions form (Appendix B, page 252) was designed for reporting cash expenses, non-deposit receipts, charged items and loss information. The format was similar to the voucher with a loss and a charged column added. In reporting charge transactions, the cooperator reported the dollars borrowed enterprise in the "charged" column. The Project Center completed the process reviewed for the monthly system.

It had been anticipated that the voucher pad or miscellaneous monthly transaction form might require immediate revisions. As a result, these instruments were not designed for direct coding and keypunching. To avoid possible confusion and non-routine procedures at the electronic farm record service center, the check information input on the above forms was transferred to the electronic farm record service forms at the Project Center.

Capital Asset Record. Both the monthly system and the check system utilized the Capital Asset Record (Appendix C, page 257). The necessary information for establishing this type of depreciation schedule was gathered using the Capital Asset Enrollment Record (Appendix C, page 261). After the record was established, the monthly input mechanism provided the necessary information for updating this record.

Supplementary Reports. As mentioned previously, not all the information essential for the business analysis could be input and retrieved using the electronic farm record system. Additional reporting forms had to be devised; they were used with both the monthly and check systems.

A Monthly Feed Record (Appendix D, page 282) was developed to allow the cooperator to report homegrown or inventoried feed fed on a monthly basis. Both volume and dollar value were reported. This form served two purposes. It provided the farmer with a record of the specific feed fed to particular classes of livestock and it provided the Project Center personnel with the information necessary in accumulating enterprise totals. The non-cash transactions entries necessary for crediting the proper crop enterprise were made by the Project Center. This duplication of effort was a deliberate attempt to avoid loss of information necessary to allow completion of a crop and feed check (inventory control) while still providing a realistic monthly enterprise statement. In addition, the cooperator needed to make only one entry of quantity per feed-livestock combination and one entry of value per feed-livestock combination; a procedure which a good electronic farm record system should allow.

A Monthly Record of Produce Used in the Home form (Appendix A, page 227 was designed to record perquisites. Each month, the original copy was completed and mailed to the Project Center where the data was accumulated and entered on the Receipts form as a non-cash credit to the proper enterprise. The electronic farm record system did not include a non-cash expense phase in the personal expenses program. This procedure thus resulted in a non-cash debit-credit imbalance which became troublesome for some cooperators.

Monthly livestock enterprise inventory forms (Appendix D, page 274) were used to collect monthly livestock numbers plus value and weight data on transferred and butchered animals. They were input to the Project Center on a quarterly basis which permitted efficient updating of the enterprise statements. Cooperators who had numerous transfers were given the option of reporting these directly as non-cash transactions.

Annual Inventories (Appendix D, page 270) were designed for each of the various livestock-enterprises, for the crop, seed and feed; for the liabilities and non-farm assets. With the exception of the liabilities and non-farm assets form, two formats were used; one listed operator-landlord shares and the other listed whole farm-landlord share.

Instructional Materials

As an aid for the experimental system cooperators and the instructors, a handbook of explanation and instruction was prepared for each system--monthly (Appendix A) and check (Appendix B). These handbooks dealt with the monthly input mechanisms. Instructions for enrolling capital assets were also provided (Appendix C). The procedures for using the inventory forms were only briefly outlined because these forms were rather self-explanatory and the cooperators had received instruction for reporting this type of information in an account book.

Test Run

Four farm families were solicited to serve as pilot cases for the study. Two families agreed to use the monthly system and two families agreed to use the check system. During the months of November and December, they reported their personal and business transactions.

When the Project Center received the November material, it was coded and mailed to the electronic farm record service. The input material was coded by their personnel and held for review. Study personnel met with the electronic farm record service personnel and identified solutions to the problems in coding and reporting.

Enrollment Meetings

As noted earlier, 26 local cooperator units were selected. Each unit had a check and a monthly system cooperator. A letter was sent to the instructors indicating the selection of his unit. It requested identification of the cooperator's livestock enterprises. This information allowed the Project Staff to compile instructional materials, and a supply of the proper forms for each farmer in preparation for the enrollment meetings with the cooperators.

Enrollment meetings were held in December. Enrollment forms were completed by the experimental record cooperators to establish a farm number in the electronic farm record service system. The purpose of the project was explained. The cooperators were informed of their operational responsibilities for inputing information as well as the need for their cooperation in evaluating the respective systems. Study personnel also briefly explained the reporting procedures and forms.

Operation

The first operational activity was for the farmer to enroll his capital assets. Using the Capital Asset Enrollment form (Appendix C) he then received a Capital Asset Record which allowed him to process monthly input. The normal monthly routine started in January with the cooperator mailing his completed input forms to the Project Center at the end of the month. The Project Center received the input, dated it, and checked it for proper identification. The check system vouchers and Miscellaneous Transactions form data were transferred to the regular electronics farm record system forms. The monthly system input was already on these forms and needed no transfer. The appropriate accumulations and transfers of data were completed for both systems. When an individual cooperator's input reached this state of completion, a Project Center worker coded the information on the electronic farm record forms.

Coding was simply the entry of the appropriate enterprise, item description, and quantity unit numbers. A coder translated the cooperator's written description into a numeric description used in the computer systems. The coding task was not complicated, but interpretation of the input was important, particularly in view of the final analysis desired.

After the coding was complete the original copies of the cooperator's input forms were mailed to the electronic farm records service. The carbon was filed. Computer center personnel again checked the coding to insure against improper use of codes or simple errors. Omissions and corrections were noted on the proper forms (Appendix A, page 230). The information was then punched and weekly computer runs were made. Monthly Detailed Transaction Report (Appendix E, page 294). The Monthly Enterprise Report (Appendix E, page 298) and the Omissions and/or Adjustment forms were mailed directly to the Project Center.

At the Project Center, the omitted and adjusted transactions were reviewed. If problems other than coding adjustments were involved, a note of explanation was prepared for mailing to the farmer. If corrections had been requested, the printout was checked and those items were identified and explained briefly. Non-cash transactions were checked for accuracy. Two copies of the printout were sent to the cooperator and one was kept in the Project Center file.

The cooperator received his printouts and filed one copy in his electronic farm record printout binder. The other copy was available for his vocational agriculture instructor. A cooperator and his instructor were free to interpret and use this material as they saw fit. If changes were necessary, a Request for Corrections (Appendix A, page was completed.

The monthly printout was received as regularly as the input procedure was initiated by the farmer. In late November or early December, the farmer received an additional printout, the Tentative Depreciation Schedule (Appendix C, page 264). This report was part of the income tax information and aided the farmer in making his tax management decisions. Following his final December input, which included an Adjustment for Tax Final form (Appendix D, page 283) the cooperator received not only his regular printout, but also his Tax Final Report (Appendix F, page 299) and his Capital Asset Record (Appendix C, page 261)both in sufficient numbers to be filed with income tax records.

Business Analysis

With the use of the electronic farm record systems as the retrieval mechanism for monthly input and as the source of monthly output, the problem of meeting the criterion of providing the information available in the Minnesota Vocational Agriculture Farm Business analysis was not solved.

The most satisfactory practical solution was to develop a computer program which would accumulate computer stored data for input into the

Minnesota Vocational Agriculture Farm Business analysis computer program. This procedure used the computer to accumulate and store basic data normally retrieved from the account books, but now gathered from monthly input. Since not all necessary information was available in the electronic system data bank, a supplementary input procedure was necessary to gather the missing information. The procedure finally adopted was to complete the necessary portions of the computer data sheets used in the regular analysis program.

Determining the compatability of the electronic systems distinct items with the account book categories was the first task. Early in the study this procedure was initiated by working through the account book section by section and recording the enterprise and item codes which might be used for transactions reported in these sections. As a result, certain item codes were restricted in their applications at the Project Center to isolate particular expenses. For example, the item code for "Other Repairs and Operation Expenses" was used for livestock equipment repair only. In the process of transferring the input data for a cooperator to his Project Center Account Book, the enterprise and the item code were noted along with the normal description. After the monthly operations had been completed through July, three account books were used to compare the earlier compatibility check with the actual reporting results.

Developing the instructions for retrieval was the next step. The procedure followed was to use the four computer data forms for the Minnesota Farm Business Management Program for identifying items. The Minnesota analysis program called for a quantity reported on a particular form, live and column. The retrieval instruction was specified for this form, line and column quantity. For example, the analysis program would request the inclusion of veterinary expenses in various calculations. To retrieve this quantity from the monthly input bank, the call instructions had to sum, over all enterprises, items coded 0090. If the program requested an item which could not be retrieved from the electronic program, the instructions specified the source of the information. Information which was not stored in the data bank, or because of some technical difficulties could not be properly retrieved, was reported on computer sheets by Project Center workers and was eventually input into the computer data bank using the punched card procedure. A set of instructions, Retrieval Information for Farm Records Project (Appendix F) was completed and given to the programmers at the electronic farm records service center who wrote the necessary programs. Using the retrieval information along with the Documentation for Farm Records previously reported, it was possible to ascertain how each transaction fit into the scheme for business analysis. At years end, two test case businesses were prepared for analysis. The information required from the Project Center was reported on computer forms. In addition, the back-up account book for each case was closed and the area analysis center procedures were followed to complete a set of computer forms. The analysis, however, was actually completed using the newly developed programs. The results were hand checked for proper entries using the account book - computer sheet information. The problems identified in the analysis reports were corrected by rewriting the computer program or the retrieval instructions.

The annual business analysis called for a number of operations by the cooperators, instructors, and personnel at the Project Center. The cooperators had to complete and submit the following forms: Crop Production for 1969, Supplementary Information, and Crop and Feed Check. Missing livestock weights had to be supplied. They also completed and submitted the end of the year inventory information. (The beginning of the year information had been input at the time of the Capital Asset Enrollment.) If they had not reported all information called for on the Monthly Livestock Enterprise Inventory and Produce Used in the Home forms, they were asked to do so. The number of sheep sheared, number of lambs sheared and number of ewes kept for lambing also was requested by correspondence. Communication to cooperators in December reminded them to submit the material necessary for record close-out. It was assumed the instructors would provide the necessary assistance.

The Project Center functioned as an area analysis center for the farmers cooperating in the project. Modifications in the procedures of a regular analysis center, as presented in the review of literature, were obviously necessary as a result of the new retrieval program.

In an attempt to avoid errors, a checklist of tasks was used by study personnel (Appendix D, page 292). While most of these tasks were directly related to the electronic farm records input, many were indirectly, if not directly, related to the desired, final analysis.

A brief narrative description of the final close-out process follows: Produce Used information was checked and totaled for the year. The non-cash credits entries were made. Non-cash expenses reported for the feeder livestock purchased in 1969 were checked and corrected if necessary. The feeder log sheets were reviewed. The Monthly Livestock Enterprise Inventories were checked for numerical accuracy, transfer data, and butchered values. Totals were accumulated and necessary non-cash entries adjustments were made. The missing weights requested for purchased dairy or breeding animals were reported on the December Receipts Forms. Since the electronic system was designed for tax purposes, it was possible to report the charge for hired labor boarded on a monthly basis. A problem was envisioned because the Supplementary Information form (Appendix D, page 285)also requested the annual charge for hired labor boarded. To avoid potential omission or duplication, the individual cooperator's printout was reviewed carefully. The amount necessary to incorporate the total hired labor boarded charge was input on the December forms. Tentative Depreciation Schedule corrections requests were reviewed and corrected if necessary. Missing Data Requests (Appendix D, page 286)were also checked for possible duplications. The form, Adjustments for Tax Final (Appendix D, page 283)was a regular form used to remove the personal or household share of expenses charged to general farm during the year, for example, real estate tax on the operator's home. It was reviewed to be sure dollar amounts were reported; not percentages. The utility adjustments were not reported because it was desirable to separate electricity and telephone. A letter (Appendix D, page 290) reported this to cooperators as a necessary tax final correction. Finally, the Enterprise Unit Request (Appendix D, page 289) was checked for appropriate crop units (Crop Production for 1969 input).

This request was to supply information used in the electronic farm record service enterprise analysis reports. These reports were normally produced as part of the computer centers electronic farm record system. They were sought for observation and a potential check on the input information.

As noted previously, the electronic farm record system would not supply all the necessary input for the business analysis and the instructions for retrieval specified the source for information to be reported at the Project Center. To simplify the procedure for inputing this information, a set of computer forms were color coded to identify the data to be reported as well as its source. The appropriate information was reported on these forms. They were mailed to the electronic farm record analysis center.

The business analysis was completed and the printout was returned to the Project Center. It was reviewed for reasonableness, problems were noted, and if necessary, corrections were requested. Finally, two copies were sent to the appropriate area agriculture coordinators, one copy was returned to the cooperator's instructor for comment and review before it was given to the cooperator, and a copy was kept at the Project Center for future reference.

With the completion of the farm analysis, the development phase of the study had reached the point of demonstrated feasibility.

CHAPTER VI

EVALUATION OF THE PROTOTYPE FARM RECORD SYSTEMS

The subjects in this study were not selected using a randomization plan. The selection criterion were basically a good understanding of record keeping and farm business analysis as judged by their vocational agriculture instructor, enrollment in the Vocational Agriculture Farm Business Management Program and a willingness to take part in a developmental study. The design did little to control variability among the subjects and does not allow generalization to all farmers. The subjects were unique compared to farmers in general. They met the study criteria which means they had received on-the-job management training, and they were experimenters or innovators. They were looking to the future. A typical comment was, "If this is what we all will be using 10 years from now, then I want to find out about it now." Compared to farmers enrolled in the Farm Business Management Programs in Minnesota, the sample subjects were less unique. A greater propensity to experiment was their defining characteristic. The evaluation procedures in this study were directed at identifying weak points in the developmental system and comparing these systems to the account book.

Project Cooperator's Views - Evaluation Phase I

As the first phase of the evaluation of the prototype systems, cooperators were instructed to list advantages and disadvantages of the system they were using compared to the account book. They were also asked how they would change their system to improve it.

Responses were returned by 15 of the monthly-system cooperators and 17 of the check system cooperators. The responses were reviewed and grouped by type.

The check system cooperators listed the following advantages for the check system versus the account book starting with the most frequently noted:

Rank	Advantage
1.	I know my income and expense for the month and the year-to-date.
2.	I am more current in entering information.
3.	Less time required per entry.
4.	Causes me to be more accurate in recording.
5.	Monthly enterprise statements are prepared.

6.	Easier to determine debt with $ Borrowed enterprises.
7.	Easier to check cash spent using printed totals.
8.	Easier to enter income and expenses.
9.	Easier to keep feed record.
11.	A more convenient depreciation schedule.
11.	Makes me separate and charge expenses to a particular enterprise when reporting.
11.	Tax planning information is available on the monthly printout (tax format).

The monthly system cooperators reported the following advantages for the monthly system compared to the account book, starting with the most frequently listed:

Rank	Advantage
1.	I know my income and expense for the month and the year-to-date.
2.	I am more current in entering information.
3.	Easier to enter income and expense.
4.	The monthly reports give me a guide for the next years cash flow budget.
6.5	Tax planning information is available on the monthly printout (tax format).
6.5	Less time required per entry.
6.5	Monthly enterprise statements are prepared.
6.5	I identify reporting errors currently.

The availability of income and expense totals for the month and the year-to-date was the most frequently listed advantage for both of the prototype systems. Being more current in entering information was the second most frequently listed advantage for both of the prototype systems. The cooperators valued the readily accessible cash information which indeed is an advertised strength of electronic farm record services. They also valued being current in reporting information, feeling or knowing they tend to make fewer mistakes if they are current in reporting.

Two groupings of the listed advantages merit consideration. Advantages directly related to the electronic farm record printout were: 'I know my income and expenses for the month and the year-to-date,' 'monthly enterprise statements are prepared,' 'easier to check cash spent using printed totals,' 'tax planning information is available on the monthly printout (tax format), ' and 'a more convenient depreciation schedule.' Advantages directly related to the input mechanisms were: 'I am more current in entering information,' 'less time required per entry,' 'it causes me to be more accurate in recording,' 'easier to enter income and expenses,' and 'makes me separate and charge expenses to a particular enterprise when reporting.'

The printout related advantages are obviously the result of a planned effort to build these specific attributes into the printout. Input mechanism related advantages are more subjective.

The design of the forms or voucher suggested an explanation of the advantages: 'less time required per entry,' 'easier to enter income and expenses,' and 'makes me separate and charge expenses to a particular enterprise when reporting.' Using a single sheet for all types of receipts and a single sheet for all types of expenses meant only two different pages had to be located when reporting. With the voucher only one sheet was used. The physical processes were simplified, and, as a result, time apparently was saved. In addition, the single sheet, or voucher required an immediate identification of the enterprise to be charged or credited. This may have reduced the chance of later misallocation.

A simple explanation for the advantage, 'I am more current in entering information,' was the compulsion to meet an established deadline. An added incentive was knowing one would not receive the full benefit of the electronic farm record service if he did not report monthly. As suggested earlier, being prompt was apparently identified with increased accuracy. The advantage, 'it causes me to be more accurate in recording,' may, in turn, be associated with being current. An alternative answer may be that accuracy was fostered by the physical design of the forms and by the information requested to allow coding.

The following disadvantages were listed by the check system cooperators for the check system versus the account book, starting with the most frequently noted:

Rank	Disadvantage
1.	A more complicated system (or evidence of misunderstanding).
2.	More difficult to re-check specific information on vouchers.
3.	Voucher pad is poorly constructed.
4.5.	Harder to identify specific items on the printout.
4.5.	More effort required when reporting.
7.5.	More difficult not to conform to the format.
7.5.	More difficult to keep feed records.

7.5. Must report the farm number too often.

7.5. Time must be taken to complete the voucher when buying the item.

The monthly system cooperators identified the following disadvantages for the monthly system compared to the account book, starting with the most frequently noted:

Rank	Disadvantage
1.	Cannot code my own transactions.
2.	A more complicated system (or evidence of misunderstanding).
5.	More problems with loose lead entry ledger.
5.	Harder to identify specific items on the printout.
5.	More difficult to recheck specific information on monthly report forms.
5.	More time required in reporting.
5.	Must follow time schedule in reporting.
10.	More work to correct errors.
10.	More difficult to find inventory information.
10.	Need to check printout.
10.	More difficult not to conform to the format.
10.	More difficult to keep feed record.

No exact agreement of rank by frequency was evident for the disadvantages listed by the proto-systems cooperators as was the case with advantages. But, the disadvantage, 'a more complicated system (or evidence of misunderstandings),' was listed more frequently by the check system cooperators and second most frequently by the monthly system cooperators.

The disadvantages can be grouped based upon their apparent source. Some disadvantages were common to both systems while others were unique to the particular system. The nature of an electronic farm record system created situations which some people considered a disadvantage compared to the account book. These disadvantages were: 'complicated system (evidence of misunderstanding,' 'more work to correct errors,' 'takes more time,' 'must check printout,' 'must conform to a format,' 'takes more effort when reporting,' and 'must follow time schedule in reporting.'

The electronic farm record service used called for computer center coding, and the developmental nature of the study logically suggested Project Center coding. The system and project design purposely produced a situation where cooperators could not code their own items.

The design of the printout also caused confusion. For most items, general standard item descriptions were used on the printout, rather than the specific description given by the farmer. For example, if the cooperator reported buying a "fan belt for the tractor,' the printout item description he received was a standard "machinery and equipment repair." Reduced computer program operating cost explained the design. Habit apparently was part of the reason for wanting the specific description printed. While the farmer could locate his original entry on his carbon copy of the input forms, it required extra time and effort to do so. Limited instruction on interpreting the printout led to unsystematic and inefficient search for individual transactions. The unfamiliar design of the printout made it difficult for some to identify items.

The monthly input mechanism undoubtedly was a major source of the stated disadvantages: 'loose leaf arrangement,' 'difficult to find inventory information' and 'more difficult to keep feed records.' With the exception of the latter, it was difficult to envision a different input mechanism. The difficult in reporting feed fed was related to the computer program and the input mechanism. Both may need to be changed.

The disadvantage, 'more difficult to recheck specific information on monthly reporting forms,' was somewhat unique to the monthly system. This reflected the arrangement of the input copies, habit, and limited instruction.

The check voucher mechanism created what some cooperators felt were disadvantages: 'more difficult to recheck specific information on the vouchers,' 'farm number is reported too often (wasted effort),' 'voucher pad is poorly constructed,' and 'time must be taken to complete the voucher when buying the item.' The difficulties encountered in rechecking vouchers for specific information and taking time to complete the voucher when making a purchase were inherent in the use of the voucher (stub) as the document of description. The latter was supposedly the time saving feature of a check based record system.

Two general observations were made concerning the reported advantages and disadvantages. The check cooperators listed more advantages for the protosystem than did the monthly cooperators, and, conversely, the monthly cooperators reported more disadvantages than did the check cooperators. One might hypothesize that the check cooperators were more optimistic about the prototype system or the check system was more satisfactory than the monthly system.

One man's advantage was often the other man's disadvantage.

Advantage	Disadvantage
Check Cooperators	
1. Less time required per entry.	1. More time required in reporting.
2. Causes me to be more accurate in reporting	2. More effort required when reporting.
3. Easier to keep feed record.	3. More difficult to keep feed record.
4. Makes one separate and charge expenses to a particular enterprise when reporting.	4. More effort required when reporting.

Advantage	Disadvantage
Monthly System Cooperators	
1. Less time required per entry.	1. More time required in reporting.
2. Easier to enter income and expenses.	2. More problems with loose leaf entry ledger.
3. I am more current in entering information.	3. Must follow a time schedule.
4. Identify reporting errors currently.	4. Need to check printout.

A few cooperators suggested improvements. However, most suggestions were directed at improving the printout, which was not an objective of the project. The suggestions were:

1. On the monthly enterprise report, add a net figure for each enterprise.
2. Report monthly and year-to-date totals for personal spending by item code.
3. Report monthly and year-to-date totals by enterprise within item categories.
4. Add an enterprise to report Social Security withheld to date (available but not specified as such).

It was also suggested that the notebook for report forms should include more guides for organization and use.

The check cooperators suggested two specific improvements in the vouchers:

1. Provide wider lines - more space.
2. Improve the perforation line - needs to tear out easier.

Regional Evaluation Meetings - Evaluation Phase II

In September and October, evaluation meetings were held at five central locations. Cooperating families, instructors, and area coordinators were requested to attend these meetings. While the major purpose of these meetings was to receive opinions and recommendations from participants, the meetings presented an excellent opportunity for direct response to cooperators questions. A cooperator noted on an evaluation form "I had no real problems, we just need more communication like today."

The agenda for the meeting was similar at all locations.

I. Discussion of coding.

II. Review Special Forms.

III. Completion of Your Opinion, Please

Break

IV. Check System Group Meeting or Monthly System Group Meeting.

V. Alternatives for Next Year.

All invited persons who were not in attendance were sent letters which emphasized the need for their evaluation. They were given a brief explanation of the three sets of evaluation material and were instructed to complete and return them to the Project Center.

The discussion of coding attempted to clarify available codes and to illustrate problems encountered in coding if descriptions were not specific and/or consistent.

Special Forms. Various forms were developed to retrieve supplemental data for both experimental groups. All participants were asked to express their view about the design and usefulness of the forms and note their comments on a worksheet. While the majority of cooperators commented, very few defined a specific change they desired.

The review of the form, Produce Used in the Home, prompted the Project Center staff to revise the method of reporting data. The responses to the statement, "I would prefer to submit information" (for Produce Used in the Home), were 14 monthly, 9 quarterly, and 19 annually. Many of the cooperators did not feel the dollar amounts were large enough to necessitate monthly inclusion in the enterprise non-cash statements. In addition, the produce used information could not be retrieved directly from the electronic farm record program. It was apparent that the solution would be a form which allowed monthly entry and annual accumulation of produce used information. The option of reporting non-cash income monthly could be exercised by the individual farmer.

The various Monthly Inventories of Livestock forms (Appendix D) were not unfamiliar to all the cooperators and instructors because they used an account book which had the same format. The responses to the statement, "I would prefer to submit information" (for Monthly Inventories), were 21 monthly, 20 quarterly, and 6 annually. The cooperators indicated little dissatisfaction with these forms. At the Project Center, it had been observed that the graphic design of these forms resulted in some cooperators unnecessarily reporting dollar amounts of sales and purchases. The revised forms are included in Appendix D.

The Crop Data form (Appendix D, page 288 which was designed solely for the Operator's historical record, satisfied most cooperators. A few cooperators expressed the desire for a more detailed field record. Since supplemental forms or booklets are available for this purpose, no revisions were requested.

"Crop Production for 19__" (Appendix D, page 284 was used to retrieve the crop production data necessary for farm business analysis but not reported elsewhere: specifically crop acreage and production for owned and rented land.

Annual inventory forms were considered satisfactory by most cooperators. Most instructors preferred to work with forms that allowed the listing of whole farm amounts and landlord's share of these amounts. Others preferred to use forms designating operator's share and landlord's share. The decision was made to discontinue the use of the operator-landlord format.

The Monthly Feed Record caused considerable concern, but was not criticized excessively. Most comments revealed that personal entry methods and habits were hard to change--not a new problem. One cooperator suggested a form revision which would incorporate inventory control. The form (Appendix D, page 282) was revised to allow this feed check procedure.

Monthly System Forms. The monthly system cooperators input their expenses and income on the forms of the electronic data processing center. For the most part, the cooperators did not indicate any particular problems with the Receipts and Losses form. In response to the question "How did you use the (Receipts) form?"; two families indicated "Completed at the end of the week," nine families indicated "Completed at the end of the month," and one family indicated "Other." Whether this response pattern reflected record-keeping habits or interpretations of the monthly input deadline is questionable. But, it would appear that these cooperators were not using this form routinely at the time of receiving income. There were no problems with the format of the form.

The Monthly Capital Assets Transaction form was not reviewed because it called only for information necessary to complete the essential calculations for the depreciation schedule.

Check System Forms. The check system cooperators input their expenses and income on check vouchers and Miscellaneous Transactions forms (Appendix B, pages 236-256). In response to questions concerning the vouchers, it became evident that the physical construction of the voucher pad has caused considerable irritation. The printing, assembling, and binding needed to be improved. Two cooperators expressed a need for more space. A few indicated a need for a format which reminded them of the information to report for livestock sales. But, in general, the cooperators reported few problems in entry on the voucher or Miscellaneous Transaction form.

In response to the question, "How did you use the voucher pad?," only three cooperators indicated "Carried and completed when making purchases," eight indicated "Completed at the end of the month," and two indicated "Other." The question "Would you be interested in using a business or journal check pad which would be completed at home?," elicited seven "no" responses and four "yes" responses. A second inquiry "Would you be interested in using the modified check voucher system?," produced ten "yes" responses and one "no" response. (The modified check voucher system was defined as basically the monthly mail-in system plus check vouchers for expenses paid by check). Responses support the preceding observation that most of the check system cooperators were dissatisfied with the check system as an input mechanism.

Questionnaire. A portion of the evaluation meeting was spent completing the questionnaire, "Your Opinion, Please." The participants were instructed to give a response (concensus for families) which best described how they would agree with the statements. Five responses similar to a Likert scale were available for each item. The small sample size made the Chi square test for independence between the check system and monthly mail-in system a questionable procedure. Combination of categories or the elimination of the no opinion category failed to produce expected frequencies which met the limitations outlined by Siegal.[1] The data is thus presented in descriptive terms only.

The first two questions were specifically aimed at determining how the proto-system cooperators felt about the system they used when the project started and when the questionnaire was completed. When the project was initiated, both groups were quite optimistic. See Table V.

At the time they completed the questionnaire, there was less optimism, as would be expected. See Table V.

Near the close of the first record year, 20.0 per cent of the check cooperators felt the system was no improvement or a disadvantage. Nineteen per cent of the monthly cooperators indicated the system was a good improvement, 33.3 per cent indicated some improvement, 19.1 per cent indicated no improvement, 23.8 per cent indicated a disadvantage, and 4.8 per cent indicated a big disadvantage. A total of 47.8 per cent indicated

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[1] Signey Siegel, Nonparametric Statistics for the Behavioral Sciences (New York: McGraw-Hill Book Company, Inc., 1956), p. 109.

TABLE V. RESPONSES OF CHECK SYSTEM COOPERATORS, THE MONTHLY MAIL-IN COOPERATORS, AND VOCATIONAL AGRICULTURE INSTRUCTORS TO THE IMPROVEMENT-DISADVANTAGE STATEMENTS IN "YOUR OPINION, PLEASE."

Cooperator's Group	Per Cent					
	Good Improvement	Some Improvement	No Improvement	A Disadvantage	Big Disadvantage	Numbers
1. When the project started, compared to the account book, I thought the system I am using would be...						
Check	66.7	33.3	0	0	0	21
Monthly	42.8	52.8	4.7	0	0	21
Vo-Ag Inst.	68.8	31.2	0	0	0	16
2. At the present time, compared to the account book, I think the system I am using is...						
Check	38.1	42.9	9.4	4.8	4.8	21
Monthly	19.0	33.3	19.1	23.8	4.8	21
Vo-Ag Inst.	25.0	68.7	6.3	0	0	16

no improvement or a disadvantage. The instructors continued to view the experimental programs more optimistically than the cooperators with 93.7 per cent considering the new system some improvement compared to 56.7 per cent for the combined experimental groups.

In response to the statement, "It is easier to identify items you have entered with the experimental record systems than with an account book," the majority disagreed. See Table VI (1). A total of 61.9 per cent of the check cooperators disagreed. Of the regular monthly cooperators, a total of 63.6 per cent disagreed. Vocational agriculture teachers supported the cooperators strongly as 76.2 per cent disagreed. A question raised, but not answered by this negative response pattern, is whether or not the cooperators and instructors would continue to find it more difficult to identify items entered after having comparable experiences and/or training with the experimental systems printout.

The statement, "It is easier to tell which enterprise has been charged with an expense with the experimental system than with the account book," illicited

TABLE VI. RESPONSES OF THE CHECK SYSTEM COOPERATORS, THE MONTHLY MAIL-IN COOPERATORS, AND VOCATIONAL AGRICULTURE INSTRUCTORS TO THE STATEMENTS IN "YOUR OPINION, PLEASE."

Cooperator's Group	Per Cent					Number
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	
1. It is easier to identify items you have entered with the experimental record systems than with an account book.						
Check	9.5	23.8	4.8	47.6	14.3	21
Monthly	4.6	22.7	9.1	40.9	22.7	22
Vo-Ag Inst.	.0	23.8	.0	61.9	14.3	21
2. It is easier to tell which enterprise has been charged with an expense with the experimental record system than with the account book.						
Check	14.3	42.8	4.8	28.6	9.5	21
Monthly	4.8	38.1	14.3	33.3	9.5	21
Vo-Ag Inst.	14.3	33.3	4.8	38.1	9.5	21
3. It is more difficult to find errors I may make in recording entries with the experimental records than with the account book.						
Check	9.5	42.8	14.3	28.6	4.8	21
Monthly	13.6	59.1	.0	22.7	4.6	22
Vo-Ag Inst.	19.0	52.3	4.8	19.0	4.8	21
4. I make fewer errors in entry with the experimental records than I did with an account book.						
Check	15.0	25.0	15.0	35.0	10.0	20
Monthly	9.5	14.3	14.3	57.1	4.8	21
Vo-Ag Inst.	4.8	33.3	23.8	38.1	.0	21
5. It is simpler to record farm expenses with the experimental records than with the account book.						
Check	23.8	14.3	9.5	42.9	9.5	21
Monthly	18.2	36.4	13.6	27.3	4.5	22
Vo-Ag Inst.	14.3	38.1	19.0	23.8	4.8	21

TABLE VI. - CONTINUED

Cooperator's Group	Per Cent					Number
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	
6. Recording income information is easier with the experimental records than with the account book.						
Check	9.5	42.9	9.5	23.8	14.3	21
Monthly	9.5	57.1	4.8	28.6	.0	21
Vo-Ag Inst.	9.5	61.9	19.1	9.5	.0	21
7. The experimental record systems make it easier to keep my record keeping up to date.						
Check	61.9	23.8	4.8	9.5	.0	21
Monthly	13.6	59.1	13.7	13.6	.0	22
Vo-Ag Inst.	47.6	33.3	9.5	4.8	4.8	21
8. Experimental records systems require less time to record transactions than does an account book.						
Check	14.3	23.8	23.8	38.1	.0	21
Monthly	.0	45.5	9.1	36.4	9.1	22
Vo-Ag Inst.	4.8	9.5	33.3	47.6	4.8	21
9. Monthly cash flow information is extremely valuable in managing my farm operation.						
Check	33.3	23.8	19.1	23.8	.0	21
Monthly	9.1	45.5	22.7	22.7	.0	22
Vo-Ag Inst.	33.3	33.3	19.1	9.5	4.8	21
10. It is easier to allocate income and expense to a specific enterprise with the experimental systems than with an account book.						
Check	9.5	57.1	28.6	4.8	.0	21
Monthly	9.1	40.9	.0	50.0	.0	22
Vo-Ag Inst.	14.3	28.6	9.5	42.8	4.8	21
11. The computerization of the record of capital assets (depreciation schedule) is well worth the time and effort required to make the initial entries.						
Check	42.8	42.8	4.8	4.8	4.8	21
Monthly	25.0	50.0	25.0	.0	.0	20
Vo-Ag Inst.	42.9	47.6	9.5	.0	.0	21

TABLE VI. - CONTINUED

Cooperator's Group	Per Cent					Number
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	
12. The process of determining income and expense to date is easier with the experimental system.						
Check	33.3	47.6	14.3	4.8	.0	21
Monthly	22.7	72.7	.0	4.6	.0	22
Vo-Ag Inst.	33.3	66.7	.0	.0	.0	21
13. The procedure for correcting errors is simple and easy to understand.						
Check	9.5	42.9	19.1	19.0	9.5	21
Monthly	.0	14.3	28.6	47.6	9.5	21
Vo-Ag Inst.	.0	23.8	28.6	38.1	9.5	21
14. There are more errors in my monthly report than I anticipated.						
Check	9.5	19.0	19.1	42.9	9.5	21
Monthly	4.8	23.8	23.8	47.6	.0	21
Vo-Ag Inst.	.0	28.6	42.8	28.6	.0	21
15. The dollars borrowed enterprises are useful in determining my credit position at the end of each month.						
Check	14.3	52.4	23.8	9.5	.0	21
Monthly	.0	50.0	31.8	13.6	4.6	22
Vo-Ag Inst.	14.3	61.9	19.0	4.8	.0	21
16. The experimental records are better tools for discussing my credit needs with my creditors than is an account book.						
Check	23.8	47.6	19.1	9.5	.0	21
Monthly	18.2	18.2	27.3	31.8	4.5	22
Vo-Ag Inst.	19.0	52.4	23.8	.0	4.0	21
17. The detailed transaction report at the end of each month reports the data in too much detail.						
Check	9.5	.0	23.8	61.9	4.8	21
Monthly	.0	4.6	13.6	72.7	9.1	22
Vo-Ag Inst.	9.5	9.5	14.3	61.9	4.8	21

TABLE VI. - CONTINUED

Cooperator's Group	Per Cent Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	Number
18. A good record system must include a monthly (or more often) cash flow statement.						
Check	19.0	57.1	4.8	14.3	4.8	21
Monthly	9.1	54.5	18.2	18.2	.0	22
Vo-Ag Inst.	9.5	61.9	9.5	14.3	4.8	21
19. Prior experience in keeping complete farm records is necessary if a farmer is to keep accurate records in the experimental systems.						
Check	33.3	38.1	.0	28.6	.0	21
Monthly	18.2	45.5	13.6	22.7	.0	22
Vo-Ag Inst.	38.1	33.3	14.3	9.5	4.8	21
20. There are too many different kinds of forms to keep track of in an experimental record system.						
Check	14.3	28.6	19.0	38.1	.0	21
Monthly	9.1	31.8	18.2	40.9	.0	22
Vo-Ag Inst.	4.8	19.0	28.6	47.6	.0	21
21. The experimental records are better adapted for filing income taxes than an account book.						
Check	23.8	38.1	33.3	4.8	.0	21
Monthly	9.1	45.5	36.4	9.1	.0	22
Vo-Ag Inst.	14.3	47.6	33.3	4.8	.0	21
22. Summary and analysis of some enterprises should be done more frequently than once per year.						
Check	9.5	23.8	33.3	33.4	.0	21
Monthly	4.6	31.8	40.9	22.7	.0	22
Vo-Ag Inst.	19.1	71.4	.0	9.5	.0	21
23. There are many items in the yearly analysis report that are not necessary for the interpretation of my business.						
Check	.0	9.5	33.3	47.6	9.5	21
Monthly	.0	9.1	54.5	36.4	.0	22
Vo-Ag Inst.	.0	14.3	23.8	42.9	19.0	21

TABLE VI. - CONTINUED

Cooperator's Group	Per Cent					Number
	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	
24. All farmers in the management program should use one of the experimental record keeping systems for their business.						
Check	14.3	33.3	19.1	23.8	9.5	21
Monthly	.0	27.3	31.8	36.4	4.5	22
Vo-Ag Inst.	.0	14.3	14.3	57.1	14.3	21
25. Reporting feed fed to livestock is easier with the experimental records than with the account book.						
Check	4.8	47.6	19.1	19.0	9.5	21
Monthly	.0	27.3	31.8	36.4	4.5	22
Vo-Ag Inst.	.0	9.5	33.3	52.4	4.8	21
26. Determining the quantity of feed fed to each livestock enterprise is essential for a complete business analysis.						
Check	31.8	57.1	4.8	.0	.0	21
Monthly	40.9	54.5	4.6	.0	.0	22
Vo-Ag Inst.	71.4	23.8	4.8	.0	.0	21
27. Keeping records in the experimental system requires more writing than the account book method.						
Check	19.0	28.6	4.8	42.8	4.8	21
Monthly	13.6	36.4	13.6	36.4	.0	22
Vo-Ag Inst.	4.8	38.1	23.8	28.6	4.7	21
28. It is easier to do farm planning with the experimental record than with the account book.						
Check	9.5	19.0	38.1	28.6	4.8	21
Monthly	.0	40.9	13.6	40.9	4.6	22
Vo-Ag Inst.	9.5	33.3	28.6	23.8	4.8	21
29. The computer center can be depended upon to do coding and computing correctly.						
Check	.0	47.6	28.6	19.0	4.8	21
Monthly	.0	42.8	28.6	23.8	4.8	21
Vo-Ag Inst.	4.8	33.3	23.8	23.8	14.3	21

TABLE VI. - CONTINUED

Cooperator's Group	Per Cent Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree	Number
30. Trying to find the correct page in the account book takes more time than recording the entries on the experimental forms.						
Check	4.8	42.8	9.5	28.6	14.3	21
Monthly	31.8	31.8	.0	27.3	9.1	22
Vo-Ag Inst.	9.5	33.3	14.4	33.3	9.5	21
31. The monthly reports are too slow. It takes too long from the time the report is sent until the output is returned.						
Check	4.5	9.1	31.8	45.5	9.1	22
Monthly	.0	9.1	36.4	50.0	4.5	22
Vo-Ag Inst.	.0	14.3	52.4	33.3	.0	21
32. Mail-in programs available from other agencies are better than the one we are using.						
Check	.0	4.8	66.6	23.8	4.8	21
Monthly	.0	.0	81.8	18.2	.0	22
Vo-Ag Inst.	.0	.0	19.1	47.6	33.3	21
33. It is easier to review the months financial activities and activities up to date with the experimental system compared to the account book.						
Check	38.1	57.2	.0	4.8	.0	21
Monthly	27.3	68.2	4.5	.0	.0	22
Vo-Ag Inst.	23.8	61.9	.0	14.3	.0	21
34. Detailed transaction reports and enterprise statements would be just as useful if they were issued quarterly instead of monthly.						
Check	.0	30.0	20.0	35.0	15.0	20
Monthly	4.6	13.6	13.6	59.1	9.1	22
Vo-Ag Inst.	19.0	14.3	14.3	52.4	.0	21

bimodal response patterns. See Table VI (2).

About 50 per cent of the combined experimental groups members agreed that it was easier to tell which enterprise had been charged and 40.5 per cent disagreed. Forty-seven and six-tenths per cent of the vocational agriculture instructors agreed that it was easier to tell which enterprise had been charged with an expense and 47.6 per cent disagreed. The responses to this statement were some indication of the unfamiliarity with the experimental system printout because the enterprise charged with an expense was specifically stated.

The responses to the statement, "It is more difficult to find errors I may make in recording entries with the experimental records than with the account book," indicated that the cooperators and instructors found it more difficult to find errors. See Table VI (3). These were logical responses because the format of the experimental system printout was new and the Minnesota Farm Account Book was familiar.

The cooperators, particularly those using the monthly system, indicated considerable disagreement with the statement, "I make fewer errors in entry with the experimental records than I did with an account book." See Table VI (4). Fifteen per cent of the check cooperators strongly agreed with this statement, 25.0 per cent agreed, 15.0 per cent had no opinion, 35.0 per cent disagreed, and 10.0 per cent strongly disagreed. Nine and five-tenths per cent of the monthly cooperators strongly agreed, 14.3 per cent agreed, 14.3 per cent had no opinion, 57.1 per cent disagreed and 4.8 per cent strongly disagreed. The vocational agriculture instructors responded to this question with relatively equal indication of disagreement and agreement.

The individual group's responses to the statement, "It is simpler to record farm expenses with the experimental records than with the account book," were quite different. See Table VI (5). The check cooperators indicated the most disagreement of the three groups with 52.4 per cent reporting disagreement. The monthly cooperators indicated the most agreement of the three groups with 54.6 per cent reporting agreement. The majority of the vocational agriculture instructors were also in agreement. These response patterns were logical because the check system was unfamiliar and involved the greatest departure from the account book.

The statement, "Recording income information is easier with the experimental records than with the account book," illicited more agreement than disagreement from a majority of each group agreeing. See Table VI (6). Over 51 per cent of the check cooperators registered some agreement. Monthly cooperators reported greater agreement with over 66 per cent recording some level of agreement. The vocational agriculture instructors indicated the most agreement. There were 71.4 per cent in one of the agreement categories. This tendency to agree was rather surprising to the project personnel. It was observed that proportionately more difficulty was encountered in reporting income than in reporting expenses. However, the mechanics of the operation would appear simpler than the account book, since only one page was involved rather than various sections of the account book.

Agreement was evidenced in the responses to "The experimental record systems make it easier to keep my record keeping up to date." See Table VI (7). Sixty-one and nine-tenths per cent of the check cooperators indicated strongly agree, 23.8 per cent indicated agree. Of the monthly cooperators, 13.6 per cent reported strongly agree, 59.1 per cent reported agree.

Forty-seven and six-tenths per cent of the vocational agriculture instructors checked strongly agree, 33.3 per cent checked agree.

The statement, "Experimental records systems require less time to record transactions than does an account book," revealed no consensus of opinion among cooperators. See Table VI (8). For the check cooperators, agreement was reported by 38.1 per cent. The same percentage reported disagreement. The remainder, 23.8 per cent, had no opinion. For the monthly cooperators, disagreement was reported by 45.5 per cent. The same percentage reported agreement. The remainder, 9.1 per cent, had no opinion. A majority of the vocational agriculture instructors disagreed. The instructors were in the observer's role, which may explain their response. A third of the instructors did not have an opinion.

The majority of each group agreed with the statement, "Monthly cash flow information is extremely valuable in managing my farm operation." See Table VI (9).

The statement, "It is easier to allocate income and expense to a specific enterprise with the experimental system than with an account book," did not elicit a clear opinion pattern. See Table VI (10). The check cooperators responded 9.5 per cent strongly agree, 57.1 per cent agree, 28.6 per cent no opinion, and 4.8 per cent disagree. The monthly cooperators responded 9.1 per cent strongly agree, 40.9 per cent agree, and 50.0 per cent disagree. The vocational agriculture instructors responded 14.3 per cent strongly agree, 28.6 per cent agree, 9.5 per cent no opinion, 42.8 per cent disagree, and 4.8 per cent strongly disagree. There was considerable difference in reports of disagreement with only 4.8 per cent of the check cooperators indicating disagreement, and 47.6 per cent of the instructors indicating disagreement.

The majority of each group agreed with the statement, "The computerization of the record of capital assets (depreciation schedule) is well worth the time and effort required to make the initial entries." See Table VI (11). Of the check cooperators, 42.8 per cent indicated strongly agree, 42.8 per cent indicated agree. Of the monthly cooperators, 25.0 per cent indicated strongly agree and 50.0 per cent indicated agree. Of the vocational agriculture instructors, 42.9 per cent indicated strongly agree and 47.6 per cent indicated agree.

Most respondents agreed that "The process of determining income and expenses to date is easier with the experimental systems." See Table VI (12). Over 80 per cent of each group checked one of the agreement categories.

The statement, "The procedure for correcting errors is simple and easy to understand," illicited a varied response. See Table VI (13). The majority of the check cooperators were in agreement. The majority of the monthly cooperators were in disagreement. A plurality of the vocational agriculture instructors were in disagreement.

The responses to, "There are more errors in my monthly report than I anticipated," registered disagreement. See Table VI (14). Nine and five-tenths per cent of the check cooperators checked strongly agree, 19.0 per cent checked agree, 19.1 per cent checked no opinion, 42.9 per cent checked disagree, 9.5 per cent checked strongly disagree. Four and eight-tenths per cent of the monthly cooperators checked strongly agree, 23.8 per cent checked agree, 23.8 per cent checked no opinion, and 47.6 per cent checked disagree. The vocational agriculture instructors were symetrically divided: 28.6 per cent checked agree, 42.8 per cent checked no opinion, and 28.6 per cent checked disagree. It should be noted that the Project Center personnel identified only eight errors in transfer of input to the printouts by the computer center during the entire year; a remarkable accuracy in view of the 40,000 transactions involved.

The majority of each group agreed that, "The dollars borrowed enterprises are useful in determining my credit position at the end of each month." See Table VI (15).

The check cooperators and the monthly cooperators responded quite differently to, "The experimental records are better tools for discussing my credit needs with my creditors than is an account book." See Table VI (16). Seventy-one and four-tenths per cent of the check cooperators agreed to some degree, compared to only 36.4 per cent of the monthly cooperators. Nine and five-tenths per cent of the check cooperators disagreed to some degree, compared to 36.6 per cent of the monthly cooperators. Seventy-one and four-tenths per cent of the vocational agriculture instructors agreed to some degree, compared to 4.8 per cent who disagreed to some degree. If the combined responses of the experimental cooperators are considered, a slight majority, 43.5 per cent, is in agreement to some degree.

The most obvious disagreement was evidenced in the responses to "The detailed transaction report at the end of each month reports the data in too much detail." See Table VI (17). The check cooperators responded: 9.5 per cent strongly agree, 23.8 per cent no opinion, 61.9 per cent disagree, and 4.8 per cent strongly disagree. The monthly cooperators responded: 4.6 per cent agree, 13.6 per cent no opinion, 72.7 per cent disagree, and 9.1 per cent strongly disagree. The vocational agriculture instructors responded: 9.5 per cent disagree, and 9.5 per cent agree, 14.3 per cent no opinion, 61.9 per cent disagree, and 4.8 per cent strongly disagree. The standard description for item categories utilized in the computer program was undoubtedly a factor because the cooperators were accustomed to looking for their personal description of the item.

There was a definite pattern of favorable responses to "A good record system must include a monthly (or more often) cash flow statement." See Table VI (18). Nineteen per cent of the check cooperators replied strongly agree, 57.1 per cent replied agree, 4.8 per cent replied no opinion, 14.3 per cent replied disagree and 4.8 per cent replied strongly disagree. Nine and one-tenth per cent of the monthly cooperators replied strongly agree, 54.5 per cent replied agree, 18.2 per cent replied no opinion, and 18.2 per cent replied disagree. Nine and five-tenths per cent of the vocational agriculture instructors replied strongly agree, 61.9 per cent replied agree, 9.5 per cent replied no opinion, 14.3 per cent replied disagree, and 4.8 per cent replied strongly disagree. An important factor to consider in analyzing these responses is that the cooperators placed some value on this aspect of the record before they began the project. It was one of the criteria they used in deciding to participate.

The majority of the individuals in each group agreed that "Prior experience in keeping complete farm records is necessary if a farmer is to keep accurate records in the experimental systems." See Table VI (19). The level of disagreement is some indication that farmers do not have to be experienced record keepers to utilize the more complex mail-in programs, but a large majority considered it an essential prerequisite.

The statement, "There are too many different kinds of forms to keep track of in an experimental record system," produced response that did not closely support either agreement or disagreement. See Table VI (20). Forty-two and nine-tenths per cent of the check cooperators responded strongly agree or agree, 38.1 per cent responded disagree, and 19.0 per cent responded no opinion. Forty and nine-tenths per cent of the monthly cooperators responded strongly agree or agree, 18.2 per cent responded no opinion and 40.9 per cent responded disagree. A strong plurality of the vocational agriculture instructors disagreed, 47.6 per cent. Of the remainder, 4.8 per cent strongly agree, 19.0 per cent agree and 28.6 per cent indicated no opinion.

The participants generally agreed that "The experimental records are better adapted for filing income taxes than an account book." See Table VI (21). This would be expected since the electronic farm record system was designed for tax purposes.

Considerable variation was evident in the responses to "Summary and analysis of some enterprises should be done more frequently than once per year." See Table VI (22). The vocational agriculture instructors were in nearly unanimous agreement, 90.4 per cent agreed or strongly agreed. The experimental system cooperators were not as agreeable. Only the monthly cooperators had a plurality in agreement. The check cooperators responded: 9.5 per cent strongly agree, 23.8 per cent agree, 33.3 per cent no opinion, and 33.4 per cent disagree. The monthly cooperators responded: 4.6 per cent strongly agree, 31.8 per cent agree, 40.9 per cent had no opinion, and 22.7 per cent disagree.

Although a relatively large percentage of the experimental systems cooperators indicated no opinion, the statement, "There are many items in the yearly analysis report that are not necessary for the interpretation of my business," was not supported. See Table VI (23).

The combined experimental group cooperators indicated agreement and disagreement in equal proportions, 37.2 per cent, in response to, "All farmers in the management program should use one of the experimental record keeping systems for their business." See Table VI (24). The vocational agriculture instructors for the most part disagreed.

The group responses to the statement, "Reporting feed fed to livestock is easier with the experimental records than with the account book," were varied. See Table VI (25). The check cooperators tended to agree; the monthly cooperators tended to disagree. The vocational agriculture instructors reported the most disagreement with 52.4 per cent indicating disagree, and 4.8 per cent indicating strongly disagree.

Strong agreement was evident for, "Determining the quantity of feed fed to each livestock enterprise is essential for a complete business analysis." See Table VI (26). There was no disagree or strongly disagree responses.

Although the plurality was in agreement, there was no consistent pattern in the responses to the statement, "Keeping records in the experimental system requires more writing than the account book methods." See Table VI (27).

"It is easier to do farm planning with the experimental record than with the account book," elicited no distinct agreement or disagreement. See Table VI (28). The check cooperators responded: 9.5 per cent strongly agree, 19.0 per cent agree, 38.1 per cent no opinion, 28.6 per cent disagree, and 4.8 per cent strongly disagree. The monthly cooperators responded: 40.9 per cent agree, 13.6 per cent no opinion, 40.9 per cent disagree, and 4.6 per cent strongly disagree. The vocational agriculture instructors replied 9.5 per cent strongly agree, 33.3 per cent agree, 29.6 per cent no opinion, 23.8 per cent disagree, and 4.8 per cent strongly disagree.

The plurality of each experimental cooperator group agreed that "The computer center can be depended upon to do coding and computing correctly." See Table VI (29).

There was no consistent pattern in the groups responses to "Trying to find the correct page in the account books takes more time than recording the entries on the experimental forms." See Table VI (30). The check cooperators responses were rather evenly divided between agree and disagree categories. The majority of the monthly cooperators agreed with the statement. The vocational agriculture instructors replied to the agree and disagree categories in equal proportions. The responses suggested that the monthly system was more convenient than the account book for some cooperators, particularly the check cooperators.

The statement, "The monthly reports are too slow. It takes too long from the time the report is sent until the output is returned," was not supported. See Table VI (31). While the majority of each of the experimental groups reported a degree of disagreement, the time at the Project Center may have been a confusing variable.

While the majority of each experimental group indicated no opinion in response to "Mail-in programs available from other agencies are better than the one we are using," the majority of vocational agriculture instructors indicated disagree or strongly disagree. See Table VI (32). The vocational agriculture instructors reported as follows: 19.1 per cent no opinion, 47.6 per cent disagree, and 33.3 per cent strongly disagree. The cooperators were, at least apparently satisfied with the electronic farm record service and the instructors supported it.

Nearly unanimous agreement was reported by the experimental cooperators in response to, "It is easier to review the months financial activities up-to-date with the experimental system compared to the account book." See Table VI (33).

The majority of each group disagreed with the statement, "Detailed transaction reports and enterprise statements would be just as useful if they were issued quarterly instead of monthly." See Table VI (34). Thirty per cent disagreed. About 68 per cent of the monthly cooperators disagreed. Vocational agriculture teachers also disagreed.

Coding Problems

One of the important functions of the Project Center personnel was to identify and evaluate problems cooperators encounter in reporting input information. During the first six months of the project, personal letters were used to clarify transactions which were improperly or incompletely reported. Since the personnel at the Project Center, as well as the cooperators, were gaining practical knowledge of the operating details of electronic farm record systems, the major emphasis of the Project Center was directed at identifying and clarifying general problem areas. Newsletters and special reports were used for this purpose.

Coding Questions. In June, the sixth record month, it became obvious that general communications were no longer producing a marked reduction in coding problems, particularly in the case of a few cooperators. It was suspected that these cooperators did not read the explanatory information. The written identification and discussion of problems was not affecting the cooperators as desired. A learning plateau had evidently been reached using the personal and general letter methods.

As a result of this situation and the need for a systematic method of recording problems, a form, Coding Questions (Appendix D, page 291) was designed. The format allowed Project Center workers to identify the transaction involved by noting the type of form, the page and line or check number, and the date. In the next four columns, the worker reported what the cooperator had input. In the appropriate column, he noted the information needed, the reason for "change" or how the information was interpreted. The last column, Other, was used to explain or request information not specifically within the format outlined. For example, capital asset numbers of purchased cows sold.

The Coding Questions form was completed in duplicate for all cooperators whose reports presented problems in July, August, September, October, and November. The July report was returned to the cooperators before his August report was due and so on.

The total number of coding questions were originally tabulated on a monthly basis. See Table VII. To facilitate the identification of the

TABLE VII. FREQUENCY OF TYPES OF CODING PROBLEMS FOR SELECTED MONTHS.[a]

	Enterprise		Item Description		Specific Transaction Data					
					Quantity					
Month	Unclear	Error	Combine	Unclear	Missing	Unit	$ Amt.	Sale-Purchase Cost	Capital Asset Transaction	Other
July	16	162	15	29	2	1	2	2	9	7
August	8	76	8	13	3	0	1	0	6	3
September	1	50	12	22	1	0	4	1	2	6
October	2	24	4	10	3	1	1	1	3	5
November	3	22	3	10	6	0	2	0	5	4

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[a] Thirty-seven cooperators who reported regularly were used as the sample for this data.

most common errors, the coding questions were also categorized under the headings: Enterprise-Error or Unclear, Item Description-Combined or Unclear, Specific Transaction Data (quantity, unit, dollar amount, sale-purchase cost information), Capital Asset Transaction, and Other.

A null hypotheses of interest was: The mean number of coding questions for the monthly system cooperators equaled the mean number of coding questions for the check system cooperators. This hypothesis of mean difference was tested using the t test with a pooled estimate of standard error of difference.[1] The t value calculated was 1.01. See Table VIII. There was not sufficient evidence to reject the hypothesis of equal means at the 20 per cent level of significance. The system which a cooperator used did not significantly affect the total numbers of questions generated in coding his monthly transactions at the Project Center.

TABLE VIII. GROUP NUMBERS, MEANS, STANDARD DEVIATIONS, AND THE t VALUE FOR MEAN DIFFERENCE IN CODING PROBLEMS.

System	Number	Mean	Standard Deviation	t Value
Check	17	13.8	8.02	
Monthly	20	16.8	9.99	1.01[a]

[a] Critical t value was approximately 1.303 at $p = .20$ and 40 degrees of freedom (45 df).

After the July form was returned, a rapid decline in the total number of problems encountered was observed. See Figure 3. A 77.8 per cent reduction in problems occurred between July and October when a new plateau was reached. Learning apparently took place at a rather rapid rate as evidenced by the rapid decline in questions. The Coding Questions form apparently was a very successful teaching device. The question frequency has dropped to a considerably lower and much more acceptable level. In the judgement of the Project Center personnel, there had been no reason to support that additional time to learn would have resulted in a major contribution to this reduction in error.

Questions concerning the enterprise involved were most frequently raised. See Figure 3. Proper specification of the enterprise for a transaction was the greatest problem the cooperators encountered based upon the information gathered at the Project Center. Part of this problem was a function of the merging of two systems. The electronic farm records system had certain enterprises which were available but if used confused the yearly summary and analysis.

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[1] William L. Hays, Statistics for Psychologists (New York: Holt, Rinehard, and Winston, 1963), p. 320.

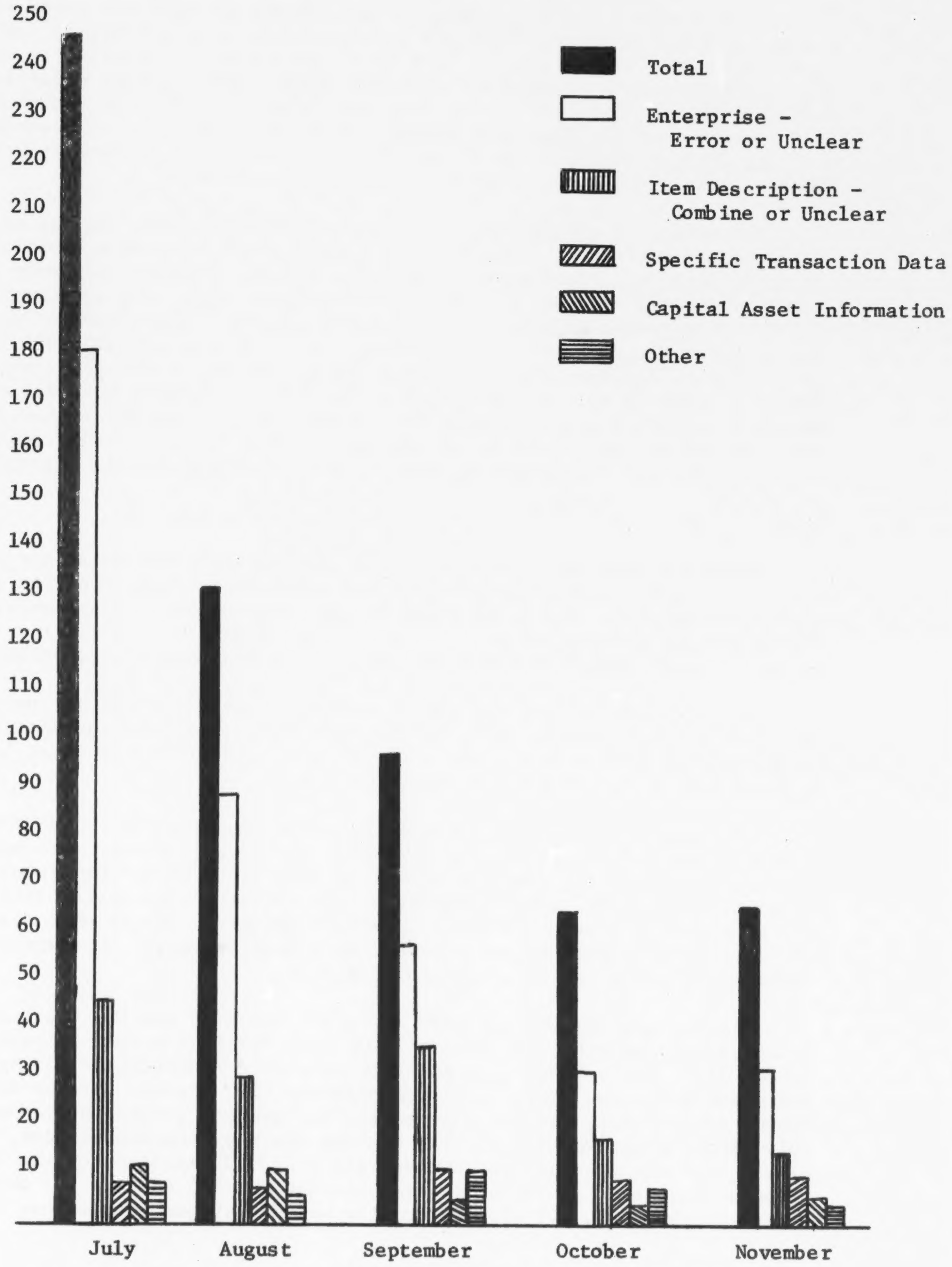

FIGURE 3. FREQUENCIES OF TYPES OF CODING PROBLEMS IDENTIFIED AT PROJECT CENTER FOR JULY THROUGH NOVEMBER.

Questions concerning the item description were asked second most frequently by Project Center personnel. See Figure 3. Combined items were responsible for about one-third of the questions in this category. These questions were assigned to the Item Description category because it usually reflected a failure to properly identify items. For example, while food and clothing are personal items, they are different items and could not be coded under a single item code number. Some items were unclear because the writing was not legible. In at least one instance, the farmer reported an item no one in the Project Center could define (shives).

The remaining categories, specific transactions data, capital asset information, and other, accounted for a small, but increasing proportion of the questions. See Figure 3. Missing volumes or quantities were an important contributor in the specific transaction data category accounting for about one-half (15 of 31) of the questions. The method of updating the computer record data bank made this a particularly significant problem. If originally omitted, the quantity would not appear on the cooperators printout, when it was reported as a correction. A Missing Data Request became a monthly routine part of the electronic farm records system during the year and provided a check on most quantities. But, it still remained necessary for the cooperator to note corrected weights on his printout.

Time

Among the proposed benefits of the monthly input mechanism for the electronic farm records system was a reduction in the time required to record transactions and a reduction in the time required to accumulate the necessary information for a farm business analysis. The latter would be particularly beneficial for the instructors and area coordinators.

As noted previously, the sample selection procedure was not defined to allow generalization. But, it was considered desirable and instinctive to accumulate time data for the study groups. This would allow at least a precursory study of the time requirements.

Time Logs. A Time Log was used to gather data on time spent recording transactions. The cooperators, including the control group, were asked to report in minutes the time they spent on these activities immediately after completing the task. This information was requested for April, July, and November, Only a limited follow-up effort was made. To be most meaningful, the data should have been accumulated on a regular basis. Cooperators were reminded to submit their completed Time Logs.

Because seasonality may have affected the time and the total number of transactions reported, the data will be considered on a monthly basis. See Table VIII. The average time spent in recording transactions for April was 133 minutes for the check system cooperators, 160 minutes for the monthly system cooperators, and 121 minutes for the control group cooperators. In July, the average was 175 minutes for the check system cooperators, 201 minutes for the monthly system cooperators and 103 minutes for the control group cooperators. In November, the average was 121 minutes for the check system cooperators, 248 minutes for the monthly system cooperators and 162 minutes for the control group cooperators. Since no mechanism for reporting the number of transactions had accompained the control group's Time Log, the assumption of a nearly equal number of transactions must be made to allow an effective comparison of the time report. Realizing many experimental cooperators felt they reported more currently with this system than with the account book, such an assumption was of questionable validity.

A simple extrapolation may be a useful procedure for evaluating this time data. The best estimate of the total time spent reporting transactions in 1969 is the product of the mean of the monthly time log data per system times 12. These estimates would be 28 hours and 36 minutes for the check system, 40 hours and 36 minutes for the monthly system, and 25 hours and 44 minutes for the control or account book. Even after granting a 15 per cent larger volume of transactions for the monthly cooperators, the proposed greater efficiency of a check system versus a monthly system would appear in the estimated means, 32 hours and 50 minutes versus 40 hours and 38 minutes. There would be no grounds to assume this difference in projected efficiency was statistically significant. Particularly, since many of the check cooperators did not report as desired, but rather at the close of each month. It also would be logical to suggest that the electronic systems had not saved the farmer any transaction entry time. The extrapolation data would suggest the monthly system had taken the most time. While the limitations of this data are many, the transaction information reported is basically the same in the experimental and control systems. Systematic analysis alone would support the contention that there would be no significant difference in reporting time.

Cooperator Time Savings. Two obvious time savings did accrue to the experimental record cooperators. The first was the reduced time required to estimate tax liability. The year-to-date information and depreciation extrapolation was available on the Monthly Detailed Transaction Report and the Tentative Depreciation Schedule. This information could be transferred to the tax form for completion of a tax liability estimate. The account book cooperator would need to calculate the appropriate totals in the book and depreciation schedule before they could be transferred to the tax form. The calculation of depreciation involves considerable time and effort for many farmers.

The second time savings was not completely independent of the first. At analysis time, the electronic system cooperators would not need to total the information reported in the sections of the account which were retrieved on the monthly input mechanisms nor would the depreciation schedule information need to be calculated and accumulated.

No attempt was made to measure the exact amount of either of these time savings. They were simply noted.

Instructor Time Savings. During the study year, it was not anticipated that the instructors would spend less time working with the cooperators. The systems were new to them and they would undoubtedly be concerned with the accuracy of the data as well as learning the systems.

TABLE IX. TIME SPENT RECORDING TRANSACTIONS USING THE CHECK, MONTHLY, OR CONTROL SYSTEM.

System	Number Reporting	Mean No. of Transactions	Minutes	
			Mean	Std. Dev.
		April		
Check	14	71	133	49
Monthly	14	80	175	41
Control	18	--	121	61
		July		
Check	16	73	175	30
Monthly	16	86	202	33
Control	17	--	103	18
		August		
Check	14	77	121	77
Monthly	11	89	248	133
Control	12	--	162	123

The aggregate savings in instructor time which may logically be anticipated will come from the accumulation of small anounts of time saved in several areas.

The electronic farm record service monitors the input. They question the validity of enterprise and item description entries. This para-professional service results in a release of teacher time to be devoted to interpretation and other facets of management education.

The teacher does not need to spend so much time monitoring the compilation of data for the annual farm business analysis. The reduction in time should be proportional to the reduction in year-end input. This assumes that the instructor did and would review the cooperator's data prior to its submission to the analysis center. It also assumes the farmer will accept the responsibility for accurate reporting. A proposed time saving for instructors assumes the cooperators have the necessary competencies to complete accurate data summaries with limited professional assistance, if any.

Analysis Center Time Savings. The analysis center procedures were handled at the Project Center. The staff was not experienced in these procedures. In addition, the procedures for the analysis were being defined. As a result, a time study was not considered appropriate. However, it is obvious that there was a reduction in time required for re-checking totals now picked up monthly. The EFR System resulted in the staff being relieved of the task of inputing the totals for analysis of the data normally retrieved from an account book.

Transfer to the appropriate computer forms of all the necessary information for a dairy operation in one case took less than 45 minutes. Painter had reported that in two hours a good account book could be transferred.[1] It is hypothesized that up to 50 per cent savings in the time required for completing computer data forms for year-end analysis may occur at the analysis center for farms using the electronic farm record system.

Subjective Observations

During the course of the years operation, certain phenomena were observed by the Project personnel. The interpretations of these phenomena are reported recognizing that they may be biased, but confident that this information will be useful in both evaluating the present study and designing future studies.

During the first two months of the study, it became apparent that many of the protosystems cooperators did not understand the limitations and regimentation inherent in a computer operation. They, like most of the general public, had been led to believe that the computer is more intelligent than man. They had to be convinced that the computer does exactly what man tells it to do, no more and not less, and that this exactness demands exactness in input. Individual methods had to be replaced with standard procedures - a matter of following instructions to the letter. It had been anticipated that a relearning process would be necessary, and indeed, it was.

Cooperator attitude was important. As one would expect, those cooperators who appeared most interested in the prototype systems were most optimistic in communications with the study personnel and adjusted to the demands of the systems most willingly. Some cooperators expressed complete satisfaction with their respective protosystem in spite of some of the problems they encountered.

Involvement in a developmental project appeared to be a strain for some cooperators and instructors. Many vocational agriculture instructors were critical of research programs which were not directed at solving immediate on-the-farm problems. They were upset by the risk of having to work with something not thoroughly defined. They were not comfortable in the role of an on-the-farm researcher. Some of the cooperators appeared to be upset with the temporary nature of certain phases of the project. In addition, the learning processes were to some extent confusing and frustrating them. In many areas, the instructions and procedures for reporting were only slightly different from the account book. Discrimination was not a simple procedure. The developmental nature of the project also created a certain element of trial and error learning with the consequent need to relearn.

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[1] Charles Painter, "Area Coordinators Newsletter," p. 2.

The monthly printout format was unfamiliar and some instructors and cooperators were more concerned with changing this mechanism than the input procedures. While cost conditions had eliminated this task from the current study, a future effort to revise the printout format was requested.

As the study progressed, it became apparent that some instructors had the mistaken idea that the study was designed to prove the electronic farm record system was better than the account book. This was not true. The purpose was to develop and to evaluate alternatives to the account book which would provide special information for persons who felt they needed it plus reduce instructor and coordinator work load. A mechanism for increasing overall efficiency of the farm management education program was more important than showing the superiority of any one kind of data retrieval process.

CHAPTER VII

SUMMARY OF THE PILOT STUDY

The potential to increase agricultural productivity by increasing management ability of farmers is just beginning to be recognized. The Minnesota Vocational Agriculture Farm Business Management Education Program has had demonstrated success in increasing individual farmers earnings. Cost-benefit analysis has suggested that an individual can expect a substantial return (4 to 1) on his educational investment in this program. Society can also expect a substantial return (2 to 1) in its investment in this program.

The Minnesota Vocational Agriculture Farm Business Management Program has its foundation in the University of Minnesota, Agricultural Economics Department's accounting and management research. The first efforts were funded by a Hill Foundation grant. Subsequently, members of the vocational agriculture education profession have developed many useful pedagogical materials and procedures. The resulting program is acknowledged for its excellence.

As this program has expanded, teacher time has become a limiting resource. Students have not dropped out; they want to receive additional instruction and to continue their farm business analysis. The latter is based upon an account book which can demand review at the end of the year; the critical teacher work load period.

With increasing farm size and narrowing profit margins, farmers and vocational agriculture instructors have expressed a need for more immediate analysis information. The advent of electronic farm record services, particularly commercially based, advertising immediate cash flow information tax service and so on, has brought about a fresh interest in examining the kinds of services these systems can provide.

Agricultural educators recognized the potential efficiency of these programs--additional information and less instructor time. But, it was also considered inefficient to discard the excellent educational inputs available in the present education program. The need for research was apparent.

The problem delimited for this portion of the study was to develop and to evaluate prototype systems of electronic farm record keeping which would provide cash-flow data on a monthly basis, income tax information, and the analysis information available in the Minnesota Vocational Agriculture Farm Business Analysis. The primary purpose was to develop an alternate to an account book which would result in a reduction in the time and energy required by the vocational agriculture instructor in working with farmers engaged in management education.

Three operational units were defined. The local cooperator unit was composed of an instructor and three cooperators. Cooperators were solicited on the basis of willingness to cooperate, three years of record keeping and business analysis, ability to keep accurate accounts, enrollment in the farm business management program, and willingness to assist in evaluating the system they used. Twenty-six local cooperator units were selected.

Agricultural Records Cooperative was selected as the electronic farm records service unit. It had: (1) an operational program which would provide monthly cash flow and enterprise information, provide capital asset information, and provide tax planning information, (2) the program and the accompanying expertise to provide the Minnesota Vocational Agriculture Farm Business analysis information, (3) personnel with demonstrated efficiency in farm accounting and record analysis, and (4) personnel interested in developmental programs.

The headquarters for study personnel was the Project Center unit. Cooperator farm business data input was received here. The input was reviewed, adjusted where necessary, and coded before being forwarded to the computer center for key punching and processing. The printout was received, reviewed, and clarified before return to the cooperators. An account book was maintained for each cooperator.

Two prototype systems were designed. The monthly system used the electronic farm record service forms to input the expense and receipt information. The check system used a check voucher and miscellaneous transaction form to report the expense and receipt information. Both systems required the use of additional input forms: Capital Asset Enrollment Record, Monthly Feed Record, Monthly Record of Produce Used in the Home, monthly livestock enterprise inventory forms, and annual inventories.

Instructional materials were prepared to explain and illustrate the input procedures. These included the Farmer's Handbook--monthly and check editions, instructions for capital asset enrollment, and an outline of inventory report procedures.

Four farm families input information for a test of the Project Center input function during November and December prior to the beginning of the 1969 record year.

Enrollment meetings were held in various central locations throughout Minnesota. Direct dialogue was used to explain the study purpose, to define the participation units and individuals responsibilities, and to explain the acutal reporting procedures.

The operation of the project began when the cooperators enrolled their capital assets and received their Capital Asset Record. Then, on a monthly basis, the cooperators submitted their transactions to the Project Center. The necessary accumulations and transfers were made in the Project Center. The items were coded for keypunching and mailed to the electronic record service. The computer center personnel checked the coding and noted corrections and omissions on the proper forms before processing the material. The monthly reports and corrections and omissions forms were returned to the

Project Center where they were reviewed and necessary explanations were made to the cooperators. Two copies of the monthly printouts were returned to the cooperators and one was filed at the Project Center. This procedure was completed as routinely as input was received.

Tax management reports useful in filing income tax reports were also returned to the cooperator via the Project Center.

Concurrent with the operation of the monthly input mechanism a procedure for a farm business analysis of computer stored data was planned and developed. A computer program was designed which automatically merged the information available from the electronic farm record service data bank with other data reported by means of the regular analysis center procedures and forms. A complete set of instructions which defined the source of all input information necessary for the farm business analysis was prepared. Computer programmers developed the necessary software. Two test records were closed using both the normal procedures and the newly defined procedures. The analysis information from the new program was checked using the data from the normal closing. Identified problems were corrected.

At the end of the year, the cooperators reported the essential supplementary closing information to the Project Center. The Project Center assumed some functions normally completed by the area analysis centers with modifications in procedure being made to accommodate the needs of the new retrieval system. The computer form information was reported and sent in for the business analysis. The business analysis was returned to the Project Center where again the analysis center function was assumed. The printout was reviewed for reasonableness. Problems were identified, and corrections requested. Correct copies were sent to the appropriate area agriculture coordinators and to the instructors for review and presentation to the cooperators. A copy was filed at the Project Center for reference. This was the last stage in the development process. A complete system had been developed and demonstrated to be functional.

The evaluation activities in the study nearly parallel the developmental activities. The first step in evaluation was simply to ask the experimental system cooperators to list advantages and disadvantages of the system they were using compared to the account book. At the same time, they were asked how they would improve their system. Check systems cooperators listed the following advantages starting with the most frequently reported:

1. I know my income and expense for the month and year to date.
2. I am more current in entering information.
3. Less time required per entry.
4. Causes me to be more accurate in recording.
5. Monthly enterprise statements are prepared.
6. Easier to determine debt with dollars borrowed enterprises.
7. Easier to check cash spent using printed totals.
8. Easier to enter income and expenses.
9. Easier to keep feed record.

10. A more convenient depreciation schedule.
11. Makes me separate and charge expenses to a particular enterprise when reporting.
12. Tax planning information is available on the monthly printout.

The monthly system cooperators reported the following advantages starting with the most frequently listed:

1. I know my income and expense for the month and year to date.
2. I am more current in entering information.
3. Easier to enter income and expenses.
4. The monthly reports give me a guide for next year's cash flow.
5. Tax planning information is available on the monthly printout.
6. Less time required per entry.
7. Monthly enterprise statements are prepared.
8. I identify reporting errors currently.

Starting with the most frequently reported, the following disadvantages were noted by the check system cooperators:

1. A more complicated system.
2. More difficult to re-check specific information on vouchers.
3. Voucher pad is poorly constructed.
4. Harder to identify specific items on the printout.
5. More effort required when reporting.
6. More difficult to keep feed records.
7. More work to correct an error.
8. Must report the farm number too often.
9. Time must be taken to complete the voucher when buying the item.

The monthly system cooperators list was:

1. Cannot "code" my own transactions.
2. A more complicated system.
3. More problems with loose leaf entry ledger.
4. Harder to identify specific items on the printout.
5. More difficult to re-check specific information on the monthly report forms.
6. More time required in reporting.
7. Must follow time schedule in reporting.
8. More work to correct errors.
9. More difficult to find inventory information.
10. Need to check printout.
11. More difficult not to conform to the format.
12. More difficult to keep feed record.

Often one man's advantage was the other man's disadvantage. It was hypothesized that the individuals opinion of the system he was using reflected more than anything else, his real desire to use the particular system.

A few cooperators suggested improvements most of which were changes in the printout; not an objective of the study. It was also suggested that the notebook for report forms should include more guides for the organization and use. The check cooperators suggested the vouchers needed wider line space and improved tear lines.

A series of evaluation meetings were held throughout the state. Cooperating families, vocational agriculture instructors, and area coordinators were requested to attend. These meetings were designed to allow direct communication and to gather participant opinions and recommendations. A letter was mailed to those not in attendance explaining the information gathered and instructing the recipients in how to report their information. The special forms developed were reviewed carefully.

The monthly system cooperators were satisfied with their input forms, but, were using them rather sporadically.

A majority of check system cooperators reporting used the check voucher incorrectly by reporting entries at the end of the month rather than at the time the check was written. A majority of the check systems cooperators were interested in a modified check voucher system—basically the monthly system plus check vouchers for expenses paid by check. Little criticism was directed at the complete system.

A questionnaire was used to gather the consensus opinions of individual cooperating families plus the opinions of instructors. The vocational agriculture instructors indicated the most optimism for the new system when the study was initiated followed by the check system cooperators and, then the monthly system cooperators. When the follow-up questionnaire was completed, there was less optimism. Eighty-one per cent of the check cooperators still felt the new system was an improvement. Fifty-two per cent of the monthly cooperators still felt it was an improvement. Ninety-four per cent of the instructors believed the new systems were an improvement.

A majority of each group agreed with the statements: "The experimental record system made it easier to keep my record keeping up to date," "Monthly cash flow information is extremely valuable in managing my farm operation," "The computerization of the record of capital assets (depreciation schedule) is well worth the time and effort required to make the initial entries," "The process of determining income and expenses to date is easier with the experimental system," "The dollars borrowed enterprises are useful in determining my credit position at the end of each month," "A good record system must include a monthly (or more often) cash flow statement," "Prior experience in keeping complete farm records is necessary if a farmer is to keep accurate records in the experimental system," "The experimental records are better adapted for filing income taxes than an account book," "Reporting the quantity of feed fed to each livestock enterprise is essential for a complete business analysis," and "It is easier to review the month's financial activities and activities up-to-date with the experimental system compared to the account book."

The majority of each group disagreed with the following statements:

"It is easier to identify items you have entered with the experimental record systems than with an account book," "I make fewer errors in entry with the experimental records than I did with an account book," "The detailed transaction report at the end of each month reports the data in too much detail," "The monthly reports are too slow--it takes too long from the time the report is sent until the output is returned," and "Detailed transaction reports and enterprise statements would be just as useful if they were issued quarterly instead of monthly."

Coding problems were identified at the Project Center for the months of July through November. A form, "Coding Questions" was designed for return to the cooperators. It allowed review and classification of the types of problems encountered. A rapid decline occurred in the coding problems encountered after use of the "Coding Questions" format.

Time data did not suggest the farmer saved any appreciable amount of time in reporting his transactions using either one of the experimental systems. But, cooperator time savings were obvious, though not statistically tested, in making tax estimates and closing the accounts for business analysis.

Instructor time savings were anticipated in future years. First, not the instructor, but the electronic farm record service will monitor the input transactions for accuracy during the year. Second, the monthly material is accumulated in proper form for yearly analysis and will not require review time.

It also appeared that up to a 50 per cent savings in time required to complete computer data forms for year end analysis may be possible at the area analysis centers.

It was observed that many of the protosystem cooperators did not understand the limitations and regimentation inherent in a computer operation. The need to follow the exact format was immediately recognized.

Cooperator attitude was important. The highly interested expressed the most satisfaction with their systems. The developmental nature of the study bothered some cooperators and instructors. Apparently, the metamorphic process and the accompanying learning were more demanding than some expected.

CHAPTER VII

COMPUTER APPLICATION TO AN AGRICULTURE MANAGEMENT PROBLEM

Farm production units fact a large number of knotty management situations that require the simultaneous consideration of many variables. Most often, the problems involve the combination of major factors of production--land, labor, capital and management--in a manner that will have some predetermined effect upon the business. This effect may be a minimizing of costs, maximizing total production, maximizing the net financial return to a portion of the business or business unit, or maximizing the returns to any of the resources considered most scarce.

Because farm operators experience these problems, they become problems of primary importance for instructors of adult farm management education programs. Therefore, a means is needed to provide instructors with useful classroom materials relevant to these areas of concern as well as providing their clients (adult farmers) with information of use in improving their management decision making.

Toward this end, a demonstration of computer application in solving one of the management problems just described was conducted as part of this project. The demonstration consisted of developing a system of determining the rations for feeding beef cattle which would minimize the feed cost per pound of beef produced. It is a procedure that takes into account both cattle information (e.g. age, physical condition, breed, sex, weight) and feed information (e.g. feed stuffs available, nutrient composition, cost).

Development and demonstration of this system was conducted in cooperation with representatives of the Department of Animal Science and the Department of Agriculture and Applied Economics at the University of Minnesota. Selection of this particular problem for demonstration of computer applications was based on expressed needs of farmers, agriculture teachers, rural legislators, and the afore mentioned University Departments. The selection was further defined by availability of computer facilities and technical consultants.

The procedure for developing the system can be described as a series of sequential steps. These steps, with some elaboration, are shown in Figure 1.

Step 1. Consultation meetings with members of the Animal Science and Agriculture and Applied Economics Departments were held to: a) determine the purposes of the system; b) establish the criteria for a feasible system; and c) evaluate the systems used by other states. The potential benefits of the system were decided to be:

a) as a management teaching aid for instruction in Animal Science and Agriculture and Applied Economics (the relationship between the two is vividly pointed out by the system); b) as a management information service for clients feeding or interested in feeding beef cattle; c) as an experimental technique for use by researchers concerned with the economic feeding of cattle; d) as a technique potentially adaptable to the feeding of other types of livestock (e.g. swine, poultry, lamb); e) as a primary management teaching aid in farm management education programs and in use in high school and post high school courses in production agriculture.

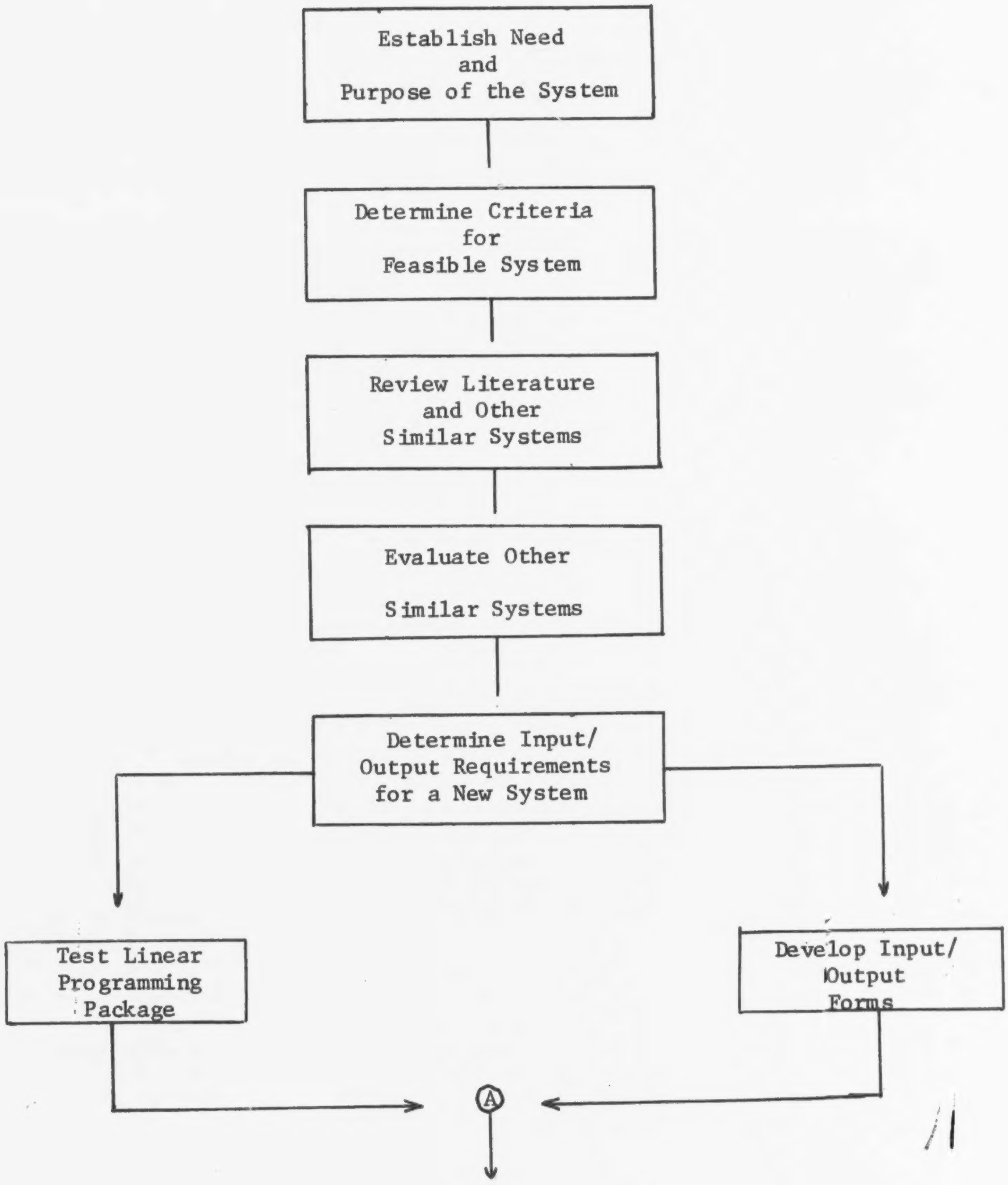
The criteria established for a successful system were: a) incorporated an input and output which were accurate, yet not requiring advanced mathematical training for comprehension, b) allowed consideration of characteristics of the cattle being fed, feedstuffs available, and feeding program followed, and c) calculated the ration on the basis of minimum feed cost per pound of body weight gained, d) provided data in a form suitable for use in instructional programs in production agriculture for youth and adults.

Step 2. The work on similar systems being done in other states was reviewed. Initial contact was by letter to other states reported to have been working on systems. Evaluation of existing systems revealed several shortcomings in terms of the criteria identified for a feasible system. These shortcomings were: a) rations were calculated on the basis of minimum feed cost per pound of ration instead of minimum feed cost per pound of gain; b) allowances were not made for a user to indicate nor the system to consider amount of feedstuff available or the characteristics of the cattle being fed; and c) provisions were not made for a feeding period consisting of two separate phases (growing and finishing) with each phase using a different ration. These limitations of existing systems were of enought importance to indicate that a new system had to be developed if the management problem (minimizing feed costs per pound of body weight gain in feeding beef cattle) was to be solved; d) output was too voluminous to be used effectively in organized classroom or on farm instruction.

Step 3. The input and output formats for the new system had to be developed. Before the input format could be decided, the information necessary for the computational part of the system had to be identified. Several methods of calculation, using a linear programming framework, were investigated. After a particular method was selected as feasible, the input format was developed. Required characteristics of the format were: a) simple to fill out; b) contain all necessary information; and c) readily transferable to computer cards without intermediate steps. A copy of the tentative input format is shown in Exhibit E. At the same time, an output format was specified. This format was designed to answer several major questions users might pose: a) how do I mix the ration; b) how much of each feedstuff will be required for the feeding period; c) what is the ration's nutrient composition; d) how much of the ration do I have to mix; e) what kind of performance can I expect if the ration is fed? A copy of the output format is shown in Exhibit F.

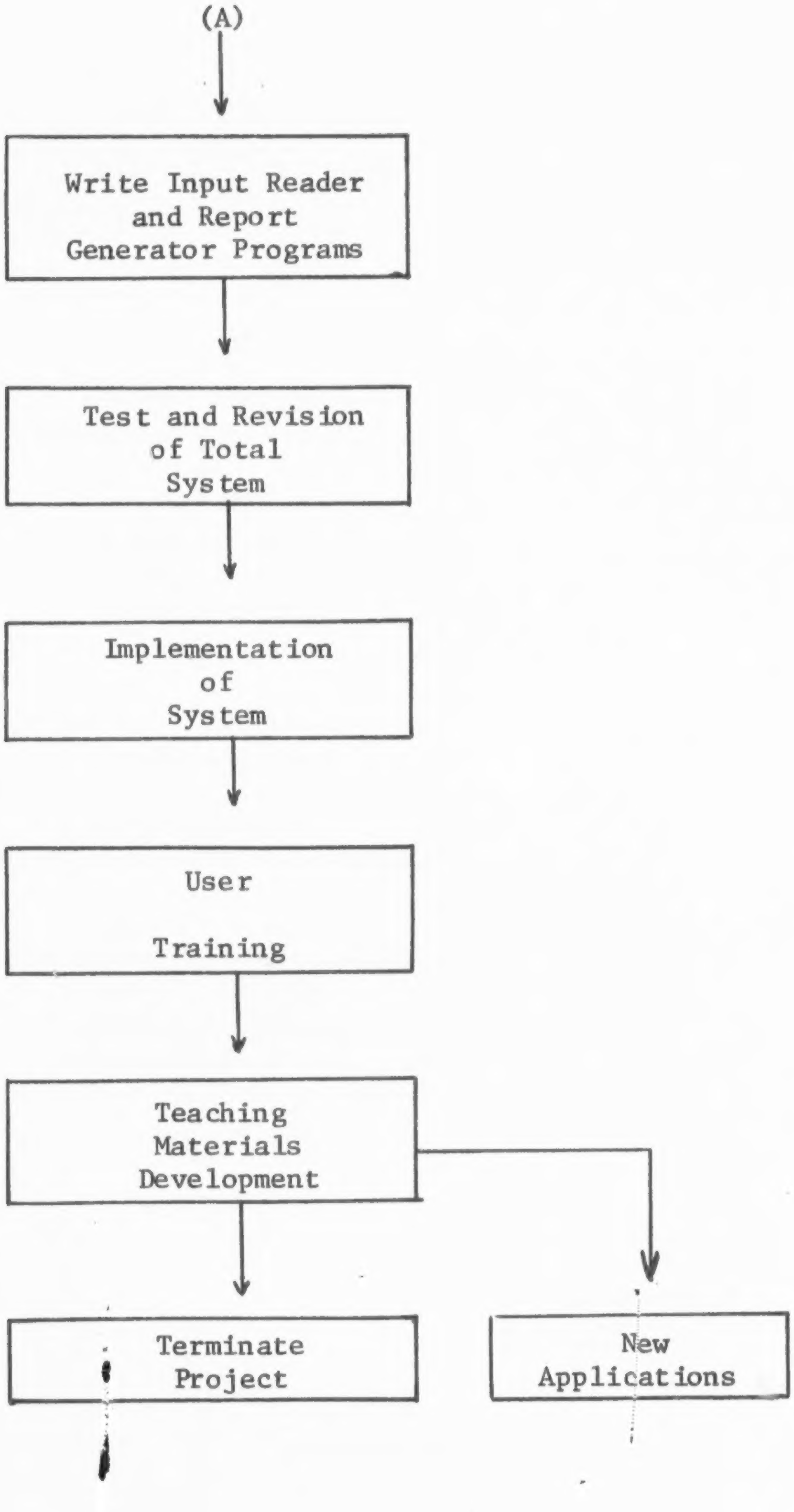
FIGURE 4.

System Development Flowchart



Establish Need and Purpose of the System
Determine Criteria for Feasible System
Review Literature and Other Similar Systems
Evaluate Other Similar Systems
Determine Input/ Output Requirements for a New System
Test Linear Programming Package
Develop Input/ Output Forms
A

Figure 4 (Cont.)


(A)
Write Input Reader and Report Generator Programs
Test and Revision of Total System
Implementation of System
User Training
Teaching Materials Development
Terminate Project
New Applications

Step 4. A computer program to operate the system had to be written. This program consisted of three basic parts: a) input reader; b) linear programming package; c) report generator. The writing of the program was contracted to the St. Paul Campus Computer Center. The input reader program had to read the computer cards punched from the input form and then reorganize the data and perform calculations necessary to format the data for input to the linear programming package.

The linear programming package actually formulated the ration meeting certain restrictions and using an objective function of minimizing feed cost per pound of body weight gain. The report generator program translated the voluminous output of the linear programming package into a condensed, usable report.

Step 5. The system must be tested as to its feasibility and validity. This is the point at which system development stands at the time this final report is being written. Initial testing of the linear programming package has already been made. Through the use of simulated data, the total system will now be tested (including the input reader and report generator). Since the linear programming portion of the system is known to be operational and documented, the primary task is to determine if the input and output programs are functioning properly. The program will be empirically tested by using records of research trials form the Animal Science Department. If the total system is functionally correct, a written documentation of the process will be made.

Step 6. An operational system must be developed which will offer the ration formulation package to teachers, their clients, and others. A tentative flowchart of this system is shown in Figure 2. The system will have a monetary cost to its users. This cost will be approximately 25-30 dollars. There are two reasons for the cost: a) the costs of forms, computer time, key punching input data, a clerk to check forms, and mailing of reports must be recovered, and b) the fee provides an umbrella under which the system can be taken over and feasibly operated by private enterprises.

Step 7. A committee of vocational agriculture teachers will be used to develop a series of teaching units and visual aids for use in high school, post-secondary, adult and extension instruction in beef cattle management.

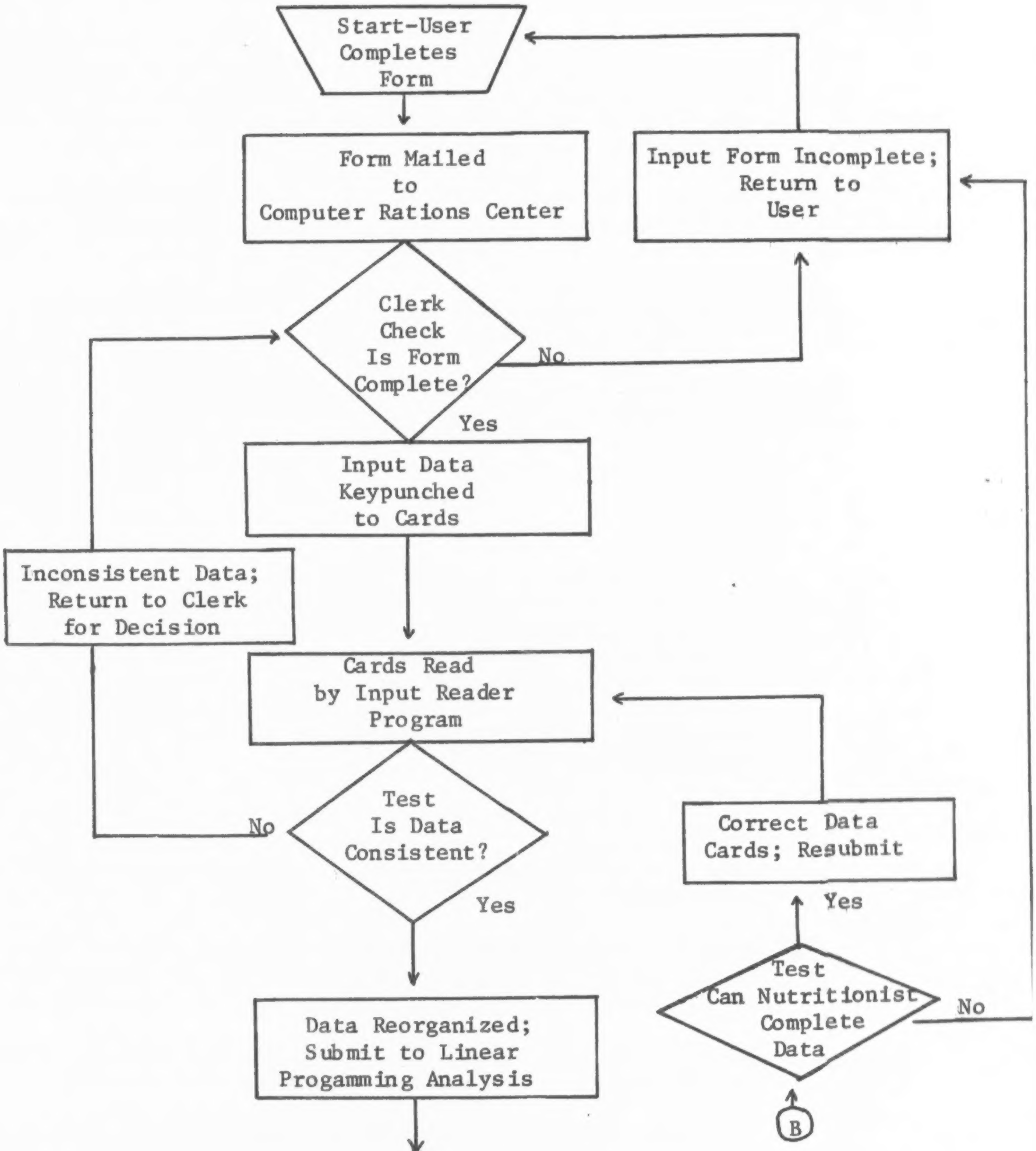
Step 8. Through workshops, short courses, telelectures, and other media, teachers of agriculture and other agriculture educators will be informed of the purpose and operational procedures of the system.

Step 9. Using the beef feeding system as a pattern, similar systems can be developed for lamb, swine, and turkey feeding.

The steps described above indicate the progress to date on system development and the work yet to be completed. The system, at this time, is short of the point where the effort will be readily adopted by the agriculture

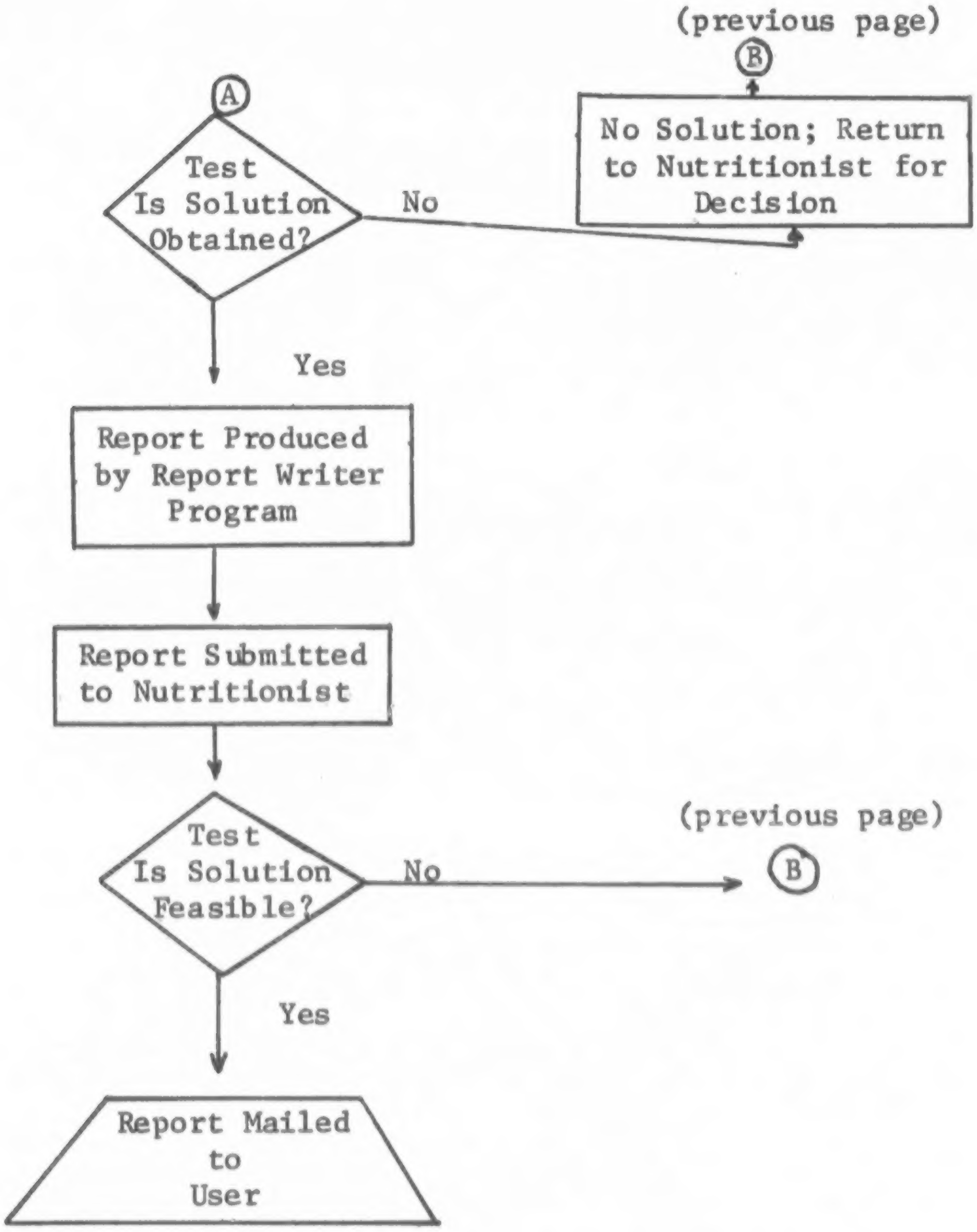
FIGURE 5.

System Operation Flowchart


Start-User Completes Form
Form Mailed to Computer Rations Center
Input Form Incomplete; Return to User
Clerk Check Is Form Complete?
No
Yes
Input Data Keypunched to Cards
Inconsistent Data; Return to Clerk for Decision
Cards Read by Input Reader Program
Test Is Data Consistent?
No
Yes
Correct Data Cards; Resubmit
Yes
Test Can Nutritionist Complete Data
No
Data Reorganized; Submit to Linear Progamming Analysis
B
A

(next page)

Figure 5 (Cont.)


(previous page)
B
A
Test
Is Solution
Obtained?
No
No Solution; Return to Nutritionist for Decision
Yes
Report Produced by Report Writer Program
Report Submitted to Nutritionist
Test
Is Solution
Feasible?
No
(previous page)
B
Yes
Report Mailed to User

education community. Therefore, arrangements have been made to carry the system to completion through funds to be provided by the Minnesota Research Coordination Unit in Occupational Education.

Although only one problem was investigated, hopefully, the development of this system has shown that the computer has application to agriculture management problems. Properly used, it can be a productive tool of the farm production unit.

COMPUTATIONAL SYSTEM

Linear programming is the mathematical technique employed in the computational system. The objective function is to minimize the feed cost per body weight gained per animal in the feeding period. The system is designed to handle a feeding period consisting of one phase or two phases. The two phase period is divided into a growing and finishing phase. This factor allows change of ration during the feeding period. In this system, the user specifies the initial weight, change over weight (for two phase feeding period) and final weight per head of cattle to be fed. For descriptive purposes, the feeding period will be assumed to be composed of two phases.

The linear program operates under five types of constraint: (a) intake, (b) gain, (c) nutrient, (d) ingredient, and (e) forage. The intake constraint pertains to how much of the ration the animal will eat per day. The assumption made in calculating the constraint is that the animal is full fed (i.e. can eat as much as it wants). The constraint is based on a "thumb" rule that a feeder animal will eat 2.2 percent of its body weight per day of 100 percent dry feed. This "thumb" rule figure of 2.2 percent is then modified by information about the cattle and ration being fed. Modifications are determined by the cattle's age, sex, breed, and condition. The modification based on the ration fed is indicated by the percent forage in the ration.

A mathematical explanation of the derivation of the daily intake constraint is as follows:

$$b_{(I)} = (2.2 + r + s + t + u + v) \quad (MBW)$$

Where:

$b_{(I)}$ = Average pounds of ration intake per day of a feeding phase.

r = Age coefficient (+0.0 if calves, +0.1 if yearlings).

s = Sex coefficient (+0.0 if heifers or mixed, +0.1 if steers)

t = Breed coefficient (+0.0 if beef, +0.1 if dairy, +0.1 if mixed).

u = Condition coefficient (-0.1 if fleshy, +0.0 if average, +0.1 if thin).

v = Forage content of ration coefficient (+0.0 if $<$ 20 percent, +0.1 if $>$20 percent).

MBW = Mid-body weight of animal in pounds during a feeding phase (beginning weight plus final weight divided by two).

Using this notation, the total intake for a feeding phase is represented by $b_I X_n$ where X_n equals the number of days in the feeding phase. If $X_1 \ldots X_{n-1}$ is used to represent the pounds of various ingredients at 100 percent dry matter which are included in the ration, then the intake constraint takes the form:

$$X_1 + X_2 + \ldots + X_{n-1} = b_{(I)} X_n \quad \text{or}$$

$$X_1 + X_2 + \ldots + X_{n-1} - b_{(I)} X_n = 0$$

This constraint indicates that the total pounds of intake contributed by each ingredient during the feeding phase minus the estimated total intake for the phase must be equal to zero. The assumption that the animals are full fed is necessitated by the form of this constraint.

The second constraint on the linear program is the amount of body weight gain to be achieved. This amount is derived by subtracting initial weight from change over weight in the growing period and change over weight from final lot weight for the finishing period.

The gain requirement is imposed in the form of a constraint on total digestible nutrient (TDN) content of the ration. The mathematical formula used to convert the weight to be gained per animal into a TDN requirement is given by Garrett, Meyer, and Lofgren.[1] Their formula is:

$$TDN = .036\ W^{.75}\ (1 + .57\ g)$$

Where:

TDN = pounds of total digestible nutrients required per day.

W = weight of animal in pounds.

g - daily gain in pounds.

Expanding the equation, it becomes:

$$TDN = .036\ W^{.75} + .021\ W^{.75}\ g$$

According to the findings of Garrett, et. al., this equation can be interpreted in the following way:

$.036\ W^{.75}$ = pounds of TDN required for body maintenance per day.

$.021\ W^{.75}\ g$ = pounds of TDN required for gain in body weight per day.

Using this formula, the average TDN requirement per day of a feeding phase should then be:

$$TDN = .036\ (MBW)^{.75} + .021\ (MBW)^{.75}\ (ADG)$$

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[1] W. N. Garrett, J. N. Meyer, G. P. Lofgren. Journal of Animal Science, Vol. 18, 1959, p. 544.

Where:

MBW = mid-body weight of animal in pounds during the feeding phase.

ADG = average pounds of daily gain in body weight.

Multiplying this equation through by the number of days in the feeding phase, X_n, gives the total TDN requirement in pounds for the phase.

$$\text{TDN}\ (X_n) = .036\ (\text{MBW})^{.75}\ (X_n) + .021\ (\text{MBW})^{.75}\ (\text{ADG})\ (X_n)$$

Since (ADG) (X_n) is average gain per day times number of days in the feeding phase, this multiple is really the gain in weight to be achieved during the phase. Therefore, the TDN requirement to achieve the desired gain is a constant in any given problem. Using GAIN to represent this constant in pounds, the equation representing the TDN requirement can be rewritten:

$$\text{TDN}\ (X_n) = .036\ (\text{MBW})^{.75}\ (X_n) + .021\ (\text{MBW})^{.75}\ (\text{GAIN})$$

The parts of this equation which are to the right of the equal sign can be again separated as follows:

$$b_{(\text{TDN})} = .036\ (\text{MBW})^{.75}\ (X_n)$$

Where $b_{(\text{TDN})}$ equals the pounds of TDN required to maintain the animal during the feeding phase and

$$G = .021\ (\text{MBW})^{.75}\ (\text{GAIN})$$

Where G equals the pounds of TDN required to produce the gain in body weight to be achieved during the feeding phase.

Letting $a_{(\text{TDN})}$ represent the percent of TDN in a particular ingredient the form of the gain constraint for a feeding phase in the linear program then becomes:

$$a_{1(\text{TDN})}X_1 + a_{2(\text{TDN})}X_2 + \dots - a_{n-1(\text{TDN})}X_{n-1} = b_{(\text{TDN})}X_n + G \quad \text{or}$$

$$a_{1(\text{TDN})}X_1 + a_{2(\text{TDN})}X_2 + \dots + a_{n-1(\text{TDN})}X_{n-1} - b_{(\text{TDN})}X_n = G$$

Verbally, this constraint is that the ration must contain enough TDN to maintain the animal during the feeding phase $(b_{\text{TDN}}X_n)$ and achieve the desired gain in body weight (G).

A third constraint on the linear program is the nutrient requirements of the cattle being fed. The nutrients included in these requirements are total protein, calcium, phosphorus and vitamin A. The requirements for these nutrients are first calculated on a per day basis. The formulas used for these calculations are:

Growing phase -

$b_{(TP)}$ = $[(.0017)(MBW)] + .7$

$b_{(C)}$ = $[(.00001)(MBW)] + .051$

$b_{(P)}$ = $[(.000018)(MBW)] + .037$

$b_{(VitA)}$ = $(25)(MBW)$

Finishing phase -

$b_{(TP)}$ = $[(.002)(MBW)] = .6$

$b_{(C)}$ = $[(.000018)(MBW)] = .0481$

$b_{(P)}$ = $[(.000018)(MBW)] - .0441$

$b_{(VitA)}$ = $(25)(MBW)$

Where:

$b_{(TP)}$ = minimum average pounds of total protein required per day.

$b_{(C)}$ = minimum average pounds of calcium required per day.

$b_{(P)}$ = minimum average pounds of phosphorus required per day.

$b_{(VitA)}$ = minimum average international units of vitamin A required per day.

MBW = mid-body weight of animal in feeding phase.

These nutrient requirements are then converted to a total feeding phase basis by multiplying by the number of days in the phase. In addition to constraints listed above, an additional constraint is used to keep the phsophorus and calcium content of the ration in balance. This constraint is that the calcium content of the ration must be greater than the phosphorus content (i.e. $C > P$).

An example of the form of nutrient constraints in the linear program is shown by the constraint for total protein during a feeding phase.

$$a_{1(TP)}X_1 + a_{2(TP)}X_2 + \ldots a_{n-1(TP)}X_{n-1} \geq b_{(TP)}X_n \quad \text{Or}$$

$$a_{1(TP)}X_1 + a_{2(TP)}X_2 + \ldots + a_{n-1(TP)}X_{n-1} - b_{(TP)}X_n \geq 0$$

Where $a_{(TP)}$ is the percent of total protein in an ingredient. This constraint assures that the total protein supplied by the ingredients during the feeding period is equal to or greater than the total protein required by an animal during the phase.

The fourth constraint on the program involves the potential ration ingredients. The constraints are: (a) what ingredients are available and (b) how much of each is available. This constraint allows the ration to be tailored for a particular feedlot enterprise. Ingredients can be available for the total feeding period or only for particular phases. The amount of ingredient available can be specified on a total period or phase basis. Specifications of amounts available are in terms of minimums and maximums. These constraints are generated from the data given on the input forms.

The form of ingredient constraints in the linear program is:

$$\begin{array}{llll} X_1 & & & \geq Min_1 \\ X_1 & & & \leq Max_1 \\ & X_2 & & \geq Min_2 \\ & X_2 & & \leq Max_2 \\ & \ldots & & \\ & & X_{n-1} & \geq Min_{n-1} \\ & & X_{n-1} & \leq Max_{n-1} \end{array}$$

Where:

X = Amount of ingredient (at 100 percent dry matter) in the ration.

Max = Maximum amount of ingredient available.

Min = Minimum amount of ingredient available.

The fifth constraint involves the forage content of the ration. Forage content is important to the system in terms of its effect on animal intake of the ration. The percent forage in the ration is given the following impact on estimating animal intake:

(1) if percent forage is between zero and twenty, there is no change in estimated intake.

(2) if percent forage is between twenty-one and one hundred, there is a +0.1 added to the percent of body weight which is taken in each day.

The use of the forage constraint necessitates the calculation of more than one problem solution in most cases. In a problem with both a growing and finishing phase, there are three potential solutions:

Potential Solutions	Percent Forage Growing	 Finishing
1	0 - 20%	0 - 20%
2	21 - 100%	0 - 20%
3	21 - 100%	21 -100%

The combination with low percent forage in growing phase and high per cent forage in finishing phase is deleted because it is not a logical feeding combination.

Each of the alternative combinations of forage constraints is expressed in the form of minimums and maximums. A solution is formulated, if possible, for each of the combinations. The solution which formulates a ration with minimum feed cost per gain produced for the feeding period is selected as the optimal solution and subsequently appears as the ration output to the user.

The mathematical form of the minimum and maximums is as a percent of total estimated feed intake for a phase. An example of the minimum and maximum forage constraint for a feeding phase is:

$$a_{1(F)}X_1 + a_{2(F)}X_2 + \ldots + a_{n-1(F)}X_{n-1} \geq b_{(F1)}X_n$$

$$a_{1(F)}X_1 + a_{2(F)}X_2 + \ldots + a_{n-1(F)}X_{n-1} \leq b_{(F2)}X_n \quad \text{or}$$

$$a_{1(F)}X_1 + a_{2(F)}X_2 + \ldots + a_{n-1(F)}X_{n-1} - b_{(F1)}X_n \geq 0$$

$$a_{1(F)}X_1 + a_{2(F)}X_2 + \ldots + a_{n-1(F)}X_{n-1} - b_{(F2)}X_n \leq 0$$

Where:

$a_{(F)}$ = percent of forage in ingredient

$b_{(F1)}$ = minimum constraint on pounds of forage intake per day (e.g. 0.0% or 21.0% of estimated intake per day)

$b_{(F2)}$ - maximum constraint on pounds of forage intake per day (e.g. 20% or 100% of estimated intake per day)

Using the ingredients available, the problem to be solved by the linear program is to formulate two rations which minimize the total feed cost over the feeding period for the total body weight gain produced per animal and meeting all of the other constraints discussed above. This problem is presented mathematically as follows:

Minimize $Z = c_{1g}X_{1g}+c_{2g}X_{2g}+\ldots+c_{n-1,g}X_{n-1,g}+c_{1f}X_{1f}+c_{2f}X_{2f}+\ldots+c_{n-1,f}X_{n-1,f}$

Subject to:

GROWING PHASE

Nutrient

Total Protein $a_{1(TP)}X_{1g}+a_{2(TP)}X_{2g}+\ldots+a_{n-1(TP)}X_{n-1,g}-b_{(TP)}X_{ng} \geq 0$

Calcium $a_{1(c)}X_{1g}+a_{2(c)}X_{2g}+\ldots+a_{n-1(c)}X_{n-1,g}-b_{(c)}X_{ng} \geq 0$

Phosphorus $a_{1(P)}X_{1g}+a_{2(P)}X_{2g}+\ldots+a_{n-1(P)}X_{n-1,g}-b_{(P)}X_{ng} \geq 0$

Calcium Phosphorus $a_{1(C-P)}X_{1g}+a_{2(C-P)}X_{2g}+\ldots+a_{n-1(C-P)}X_{n-1,g} \geq 0$

Vitamin A $a_{1(V)}X_{1g}+a_{2(V)}X_{2g}+\ldots+a_{n-1(V)}X_{n-1,g}-b_{(V)}X_{ng} \geq 0$

Salt $a_{1(S)}X_{1g}+a_{2(S)}X_{2g}+\ldots+a_{n-1(S)}X_{n-1,g}-b_{(S)}X_{ng} \geq 0$

Forage $a_{1(F)}X_{1g}+a_{2(F)}X_{2g}+\ldots+a_{n-1(F)}X_{n-1,g}-b_{(F1)}X_{ng} \geq 0$

$a_{1(F)}X_{1g}+a_{2(F)}X_{2g}+\ldots+a_{n-1(F)}X_{n-1,g}-b_{(F2)}X_{ng} \leq 0$

Intake $X_{1g}+X_{2g}+\ldots+X_{n-1,g}-b_{(I)}X_{ng} = 0$

Gain $a_{1(TDN)}X_{1g}+a_{2(TDN)}X_{2g}+\ldots+a_{n-1(TDN)}X_{n-1,g}-b_{(TDN)}X_{ng} = G_g$

Ingredient

Minimums	X_{1g}				$\geq \mathrm{Min}_{1g}$
		X_{2g} ...			$\geq \mathrm{Min}_{2g}$
			$X_{n-1,g}$		$\geq \mathrm{Min}_{n-1,g}$
				X_{ng}	$\geq \mathrm{Min}_{n,g}$
Maximums	X_{1g}				$\leq \mathrm{Max}_{1g}$
		X_{2g} ...			$\leq \mathrm{Max}_{2g}$
			$X_{n-1,g}$		$\leq \mathrm{Max}_{n-1,g}$
				X_{ng}	$\leq \mathrm{Max}_{ng}$

FINISHING PHASE

Nutrient		
Total Protein	$a_{1(TP)}X_{1f} + a_{2(TP)}X_{2f} + \dots + a_{n-1(TP)}X_{n-1,f} - b_{(TP)}X_{nf}$	≥ 0
Calcium	$a_{1(C)}X_{1f} + a_{2(C)}X_{2f} + \dots + a_{n-1(C)}X_{n-1,f} - b_{(C)}X_{nf}$	≥ 0
Phosphorus	$a_{1(P)}X_{1f} + a_{2(P)}X2f + \dots + a_{n-1(P)}X_{n-1,f} - b_{(p)}X_{nf}$	≥ 0
Calcium-Phosphorus	$a_{1(C-P)}X_{1f} + a_{2(C-P)}X_{2f} + \dots + a_{n-1(C-P)}X_{n-1,f}$	≥ 0
Vitamin A	$a_{1(V)}X_{1f} + a_{2(V)}X_{2f} + \dots + a_{n-1(V)}X_{n-1,f} - b_{(V)}X_{nf}$	≥ 0
Salt	$a_{1(S)}X_{1f} + a_{2(S)}X_{2f} + \dots + a_{n-1(S)}X_{n-1,f} - b_{(S)}X_{nf}$	≥ 0
Forage	$a_{1(F)}X_{1f} + a_{2(F)}X_{2f} + \dots + a_{n-1(F)}X_{n-1,f} - b_{(F1)}X_{nf}$	≥ 0
	$a_{1(F)}X_{1f} + a_{2(F)}X_{2f} + \dots + a_{n-1(F)}X_{n-1,f} - b_{(F2)}X_{nf}$	≤ 0
Intake	$X_{1f} + X_{2f} + \dots + X_{n-1,f} - b_{(I)}X_{nf}$	$= 0$
Gain	$a_{1(TDN)}X_{1f} + {}_{2(TDN)}X_{2f} + \dots + a_{n-1(TDN)}X_{n-1,f} - b_{(TDN)}X_{nf}$	$= G_f$
Ingredient		
Minimums	X_{1f}	$\geq Min_{1f}$
	X_{2f}	$\geq Min_{2f}$
	$\dots$ $X_{n-1,f}$	$\geq Min_{n-1,f}$
	X_{nf}	$\geq Min_{nf}$
Maximums	X_{1f}	$\leq Max_{1f}$
	X_{2f}	$\leq Max_{2f}$
	$\dots$ $X_{n-1,f}$	$\leq Max_{n-1,f}$
	X_{nf}	$\leq Max_{nf}$

BOTH PHASES

Ingredient

Minimums X_{1g} $+X_{1f}$ $\geq Min_{1,gf}$

$X_{2g}\ldots$ $+X_{2f}\ldots$ $\geq Min_{2,gf}$

$X_{n-1,g}$ $+X_{n-1,f}$ $\geq Min_{n-1,gf}$

Maximums $X1g$ $+X_{1f}$ $\leq Max_{1,gf}$

$X_{2g}\ldots$ $+X_{2f}$ $\leq Max_{2,gf}$

$X_{n-1,g}$ $+X_{n-1,f}$ $\leq Max_{n-1,gf}$

ALL X ≥ 0

Where:

c = cost of ingredient (dollars)

$X_1 \ldots X_{n-1}$ = pounds of ingredient in ration for phase

X_n = number of days in the feeding phase

$^{a}.(TP)$ = per cent of total protein in ingredient (per pound)

$^{a}.(c)$ = per cent of calcium in ingredient (per pound)

$^{a}.(P)$ = per cent of phosphorus in ingredient (per pound)

$^{a}.(C-P)$ = per cent of calcium minus per cent of phosphorus in ingredient (per pound)

$^{a}.(V)$ = I.U. of vitamin A in ingredient (per pound)

$^{a}.(S)$ = per cent of salt in ingredient (per pound)

$^{a}(F)$ = per cent of forage in ingredient

$^{b}(TP)$ = pounds of calcium required per day

$^{b}(c)$ = pounds of calcium required per day

$^{b}(P)$ = pounds of phosphorus required per day

$^{b}(V)$ = I.U. of vitamin A required per day

$^{b}(S)$ = pounds of salt required per day

$^{b}(F1)$ = minimum pounds of forage required per day

$^{b}(F2)$ = maximum pounds of forage required per day

$^{b}(I)$ = pounds of ration the animal will intake per day

$^{a}(TDN)$ = per cent of total digestible nutrients in ingredients

$^{b}(TDN)$ = pounds of total digestible nutrients required to maintain animal per day

G = pounds of total digestible nutrients required to achieve desired gain in particular phase

Min = minimum amount of ingredient available

Max = maximum amount of ingredient available

Note:

1. g and f are used to denote growing and finishing phase, respectively.
2. gf is used to denote total feeding period.

Operational System

The inputing document for ComputeRations-Beef was designed for simplicity and accuracy in reporting data. An important feature was the option provided to the user. He may accept the standards for nutrition and nutritive content provided by the form or he may substitute value more appropriate to his own situation.

The user has three essential choices he must make.

1. He must decide if he wishes a ration based on least cost per pound of gain or least cost for a given gain per day.

2. He must decide if he wishes to accept National Research Council standards for nutrient requirements or establish his own.

3. He must decide if he wishes to use the nutrient composition of feeds as stated by the National Research Council or substitute other composition values as he may have determined from feed and forage testing.

Once the user has made these choices, he can accurately complete the input forms. The form was programmed and generated by the computer to insure that the data appearing in the feeds section is identical to the information stored in the computer program. The input form, ComputeRations-Beef is shown on page 200, as Exhibit E. The instructions below were written to guide users during the test phase in the accurate completion of the input data form. As a result of the use of these instructions and initial user experience with the forms, some modifications were made both in the instructions and the reporting format.

Instructions for Completing ComputeRations Beef Input Form

1. OWNER INFORMATION

   Print name and address of person to whom form is to be sent. The DATE is the date on which the form is completed.

2. CATTLE INFORMATION

   LOT NO can be used to identify a particular lot if you have more one. Items 2A through 2F must be complete if the ration is to be calculated. Item 2G should contain your estimate of the final lot weight per head at which you would like to sell your cattle.

   ComputeRation Beef gives you the option of feeding a single ration for the total feeding period or dividing the feeding period into two phases. The two phase feeding period is divided into a GROWING and FINISHING phase.

Item 2H allows you to specify four different feeding plans:

(1) If you want just a GROWING phase ration (i.e., take animals from 400 to 700 lbs. in body weight), then indicate the final lot weight per head at which you will change to a FINISHING ration (i.e., 600, 700, or 800 lbs. in body weight).

(2) If you want both a GROWING and FINISHING ration (i.e., take animals from 400 to 1000 lbs. in body weight), then indicate the lot weight at which you will change from the GROWING to the FINISHING ration (i.e., 600, 700, or 800 lbs. in body weight).

(3) If you want both a GROWING AND FINISHING phase, but wish to feed the same ration during both phases, then check IGNORE.

(4) If you want just a FINISHING ration (i.e., take animals from 700 to 1000 lbs. in body weight), then do not check any of the alternatives under 2H.

3. RATION INFORMATION

Item 3A1 allows you to specify non-feed costs per head per day. (i.e., interest on investment, veterinary costs). Specify zero cents if you want the ration to depend only on feed costs.

Item 3A is the cost of salt if it is different than $1.00 per 100 lbs. If it is $1.00 for 100 lbs. then leave Item 3A blank. The salt requirement of the ration is assumed to be .1 lbs. per day.

Item 3B specifies the feeding plan which you wish to follow. The alternative which is checked should be consistent with the information presented in Item 2H.

Item 3C allows you to specify which of two methods of selecting your ration is to be followed. Check alternative one if you want the computer to select the ration giving minimum cost average daily rate of gain for the feeding period. Check alternative two if you want to specify a particular average daily rate of gain and on that basis want the computer to select the minimum cost ration(s). If you check alternative two, then you must specify the average daily rate of gain which you want for your cattle. The rate of gain specified must be reasonable considering the ingredients you have available or you will not get a ration calculated.

Item 3D refers to the nutrient requirement you want for the ration(s) which are formulated. Again you have two alternatives. Check alternative one if you want to use the National Research Council Standards for requirements per head per day for total protein, calcium, phosphorus, and Vitamin A. Check alternative two if you want to specify nutrient requirements for the ration to be calculated. If you check alternative two, then you must complete the table indicating the requirements which you want to impose. Note that the requirements are on the basis of per head per day.

Item 2E pertains to feed requirements in terms of the ingredients you have available (own or can buy). It also contains information on when the ingredient is available (i.e., growing phase, finishing phase, or both phases), the amount available (more than or less than a certain amount), the cost, and the nutrient composition. There are 42 standard ingredients from which you can choose plus you have the option of adding additional ingredients such as commercial supplements.

Completion of this section of the input form is explained by using ALFALFA BROME HAY as an example. Following across the form in the row labeled ALFALFA BROME HAY, the first column is labeled CHECK. Check G if it is available for growing phase, F if available for finishing phase, and both G and F if available for both phases.

The next column is labeled FEED SUPPLY RESTRICTIONS. This column is further divided into MORE THAN and LESS THAN columns. These columns allow you to specify limits on the quantity of ALFALFA BROME HAY available (i.e., more than 40 ton but less than 60 ton) for the total number of cattle in this lot. There are two ways of indicating a restriction; (a) for a specific phase, (b) over the total feeding period (i.e., 2 phases).

If the ingredient restrictions are for one phase only, then place the restriction in the appropriate row (i.e., following the G or F). If the ingredient restrictions are over the total feeding period, then write larger and over the orange dotted line separating the G and F rows.

Example: Ingredient restriction only in growing phase.

INGREDIENT	CHECK	///	FEED SUPPLY RESTRICTIONS MORE THAN	 LESS THAN	COST PER UNIT
ALFALFA BROME HAY	G ✓	001	80 TON	60 TON	$/TON 20 00
	F ✓	101	TON	TON	$/TON 30 00

Example: Ingredient restriction over the total feeding period.

INGREDIENT	CHECK	/// /// /// /// ///	FEED SUPPLY RESTRICTIONS		COST PER UNIT
			MORE THAN	LESS THAN	
ALFALFA BROME HAY	G ✓	001	TON 80	TON 100	$/TON 20.00
	F ✓	101	TON	TON	$/TON 20.00

Restrictions on feed supply should not be used unless absolutely necessary (i.e., have silo full of silage which must be fed off).

The COST PER UNIT column allows specification of ingredients cost in the units designated. Costs should be placed in the F or G rows. If an ingredient is available in both phases and the cost is the same in both phases, then the G and F row will have the same cost for a particular ingredient. (See example above: ingredient available in both phases).

The next group of columns deal with the nutrient composition of the ingredients. Composition specified for the standard ingredients is an average. If the composition is different for your ingredients, write the change over the composition specified on the input form.

The last page of the input form allows you to add additional ingredients. Print the name of the ingredient in the first column and the units in which you are going to specify the amount available and the cost. For those ingredients which you add, you must also specify the nutrient composition.

Each ration must include a primary source of calcium, phosphorus, and Vitamin A.

The input form shown in Exhibit E has been completed to illustrate a typical feedlot situation.

ComputeRations Beef Output

Exhibit F illustrates the output from ComputeRations-Beef.

COMPUTERATIONS

BEEF

UNIVERSITY OF MINNESOTA
ST. PAUL CAMPUS

A
JOINT DEPARTMENTAL EFFORT
BY
AGRICULTURE EDUCATION
ANIMAL SCIENCE
AGRICULTURE ECONOMICS EXTENSION
ST. PAUL CAMPUS COMPUTING CENTER

COMPUTERATIONS IS AN INNOVATIVE STUDY APPLYING A COMPUTERIZED LINEAR PROGRAMMING SYSTEM TO FORMULATING EFFICIENT ANIMAL RATIONS. 'COMPUTERATIONS-BEEF' FORMULATES FEEDER CATTLE RATIONS USING AN EFFICIENCY CRITERION OF A LEAST COST RATION PER POUND OF BODY WEIGHT GAIN. THIS FORM IS BEING TESTED AS A METHOD OF COLLECTING THE NECESSARY INFORMATION.

GENERAL INSTRUCTIONS

1. USE SHARP BLACK PENCIL
2. PRINT CLEARLY WITHIN THE MARGINS
3. READ INSTRUCTION SHEET BEFORE MARKING

FORM BFR-70062

EXHIBIT E

BASIC INFORMATION

1. OWNER INFORMATION: NAME:______________________________ DATE:______________

ADDRESS:______________________________

CITY:________________ STATE:__________ ZIP CODE:_______ 70062

---

2. CATTLE INFORMATION: (LOT NO._____)

A. NUMBER OF CATTLE IN YOUR LOT:________

B. AGE (CHECK ONLY ONE): CALVES....( )1
YEARLINGS.( )2

C. SEX (CHECK ONLY ONE): STEERS...( )1
HEIFERS..( )2
MIXED....( )3

D. BREED (CHECK ONLY ONE): DAIRY..( )1
BEEF...( )2
MIXED..( )3

E. CONDITION(CHECK ONLY ONE): THIN.( )1
AVERAGE.( )2
FLESHY..( )3

F. PRESENT AVERAGE WEIGHT PER HEAD (POUNDS):________

G. WEIGHT PER HEAD AT WHICH YOU WANT TO SELL (POUNDS):________

H. WEIGHT PER HEAD AT WHICH YOU WANT TO CHANGE FROM THE GROWING TO THE FINISHING PHASE (CHECK ONLY ONE): 600 LBS( )1
700 LBS( )2
800 LBS( )3
IGNORE.( )4

---

3. RATION INFORMATION:

A. SPECIFY THE COST OF SALT ONLY IF DIFFERENT FROM $1/100 LBS:________

B. SPECIFY WHAT RATION YOU WANT CALCULATED (CHECK ONLY ONE):GROWING PHASE..( )1
FINISHING PHASE( )2
BOTH PHASES....( )3

C. GAIN REQUIREMENTS(CHECK ONLY ONE):

I WANT LEAST COST RATE OF GAIN..( )1

I WILL SPECIFY RATE OF GAIN IN THE TABLE BELOW AND I WANT THE LEAST COST RATION..........( )2

	GROWING PHASE	FINISHING PHASE
LBS/HEAD/DAY		

D. NUTRIENT REQUIREMENTS (CHECK ONLY ONE):

I WANT TO USE THE NATIONAL RESEARCH COUNCIL STANDARDS FOR REQUIREMENTS / HEAD / DAY......( )1

I WILL SPECIFY REQUIREMENTS IN THE TABLE BELOW.............( )2

	LBS/HEAD/DAY			IU/HEAD/DAY
	TOTAL PROTEIN	CALCIUM	PHOS-PHORUS	VITAMIN A
GROWING PHASE				
FINISHING PHASE				

E. FEED REQUIREMENTS: (READ THE INSTRUCTIONS AND COMPLETE THE FOLLOWING PAGES)

INGREDIENTS	CHECK	///	FEED SUPPLY RESTRICTIONS		COST PER UNIT	NUTRIENT INFORMATION					
			MORE THAN	LESS THAN		DRY MATTER (%)	TOTAL PROTEIN (%)	TOTAL DIGEST. NUTRI. (%)	CALCIUM (%)	PHOS-PHORUS (%)	VITAMIN A (IU/LB)
ALFALFA BROME HAY	G	001	TON	TON	$/TON	90.00	13.25	48.90	0.81	0.22	5000
	F	101	TON	TON	$/TON	90.00	13.25	48.90	0.81	0.22	5000
ALFALFA HAY EARLY	G	002	TON	TON	$/TON	90.00	16.60	51.00	1.12	0.21	20800
	F	102	TON	TON	$/TON	90.00	16.60	51.00	1.12	0.21	20800
ALFALFA HAY MID	G	003	TON	TON	$/TON	90.00	15.40	51.00	1.22	0.20	5400
	F	103	TON	TON	$/TON	90.00	15.40	51.00	1.22	0.20	5400
ALFALFA HAY FULL	G	004	TON	TON	$/TON	90.00	14.30	49.50	1.15	0.18	4500
	F	104	TON	TON	$/TON	90.00	14.30	49.50	1.15	0.18	4500
BROME GRASS HAY	G	005	TON	TON	$/TON	90.00	11.10	46.80	0.39	0.25	4500
	F	105	TON	TON	$/TON	90.00	11.10	46.80	0.39	0.25	4500
OATS HAY	G	006	TON	TON	$/TON	90.00	8.30	49.50	0.23	0.22	3600
	F	106	TON	TON	$/TON	90.00	8.30	49.50	0.23	0.22	3600
OATS STRAW	G	007	TON	TON	$/TON	90.00	4.00	47.00	0.30	0.09	0
	F	107	TON	TON	$/TON	90.00	4.00	47.00	0.30	0.09	0
RED CLOVER HAY	G	008	TON	TON	$/TON	90.00	13.40	49.50	1.45	0.20	5850
	F	108	TON	TON	$/TON	90.00	13.40	49.50	1.45	0.20	5850
REED CANARYGRASS HAY	G	009	TON	TON	$/TON	90.00	7.90	41.40	0.30	0.22	14400
	F	109	TON	TON	$/TON	90.00	7.90	41.40	0.30	0.22	14400
TIMOTHY HAY EARLY	G	010	TON	TON	$/TON	90.00	7.80	48.60	0.54	0.23	9000
	F	110	TON	TON	$/TON	90.00	7.80	48.60	0.54	0.23	9000
TIMOTHY HAY MID	G	011	TON	TON	$/TON	90.00	7.60	54.00	0.37	0.17	7200
	F	111	TON	TON	$/TON	90.00	7.60	54.00	0.37	0.17	7200
TIMOTHY HAY FULL	G	012	TON	TON	$/TON	90.00	7.10	45.00	0.31	0.19	1440
	F	112	TON	TON	$/TON	90.00	7.10	45.00	0.31	0.19	1440

FEED INFORMATION

INGREDIENTS	CHECK	///	FEED SUPPLY RESTRICTIONS		COST PER UNIT	NUTRIENT INFORMATION					
			MORE THAN	LESS THAN		DRY MATTER (%)	TOTAL PROTEIN (%)	TOTAL DIGEST. NUTRI. (%)	CALCIUM (%)	PHOS-PHORUS (%)	VITAMIN A (IU/LB)
ALFALFA BROME HAYLAGE	G	013	TON	TON	$/TON	45.00	6.60	24.45	0.40	0.11	2500
	F	113	TON	TON	$/TON	45.00	6.60	24.45	0.40	0.11	2500
ALFALFA HAYLAGE EARLY	G	014	TON	TON	$/TON	45.00	8.30	25.50	0.56	0.10	10400
	F	114	TON	TON	$/TON	45.00	8.30	25.50	0.56	0.10	10400
ALFALFA HAYLAGE MID	G	015	TON	TON	$/TON	45.00	7.70	25.50	0.61	0.10	2700
	F	115	TON	TON	$/TON	45.00	7.70	25.50	0.61	0.10	2700
ALFALFA HAYLAGE FULL	G	016	TON	TON	$/TON	45.00	7.15	24.50	0.58	0.09	2250
	F	116	TON	TON	$/TON	45.00	7.15	24.50	0.58	0.09	2250
CORN SILAGE	G	017	TON	TON	$/TON	35.00	2.90	23.20	0.12	0.08	2800
	F	117	TON	TON	$/TON	35.00	2.90	23.20	0.12	0.08	2800
CORN STOVER	G	018	TON	TON	$/TON	40.00	2.60	22.00	0.20	0.04	320
	F	118	TON	TON	$/TON	40.00	2.60	22.00	0.20	0.04	320
BARLEY GRAIN	G	019	BU	BU	$/BU	89.00	11.60	71.20	0.08	0.42	0
	F	119	BU	BU	$/BU	89.00	11.60	71.20	0.08	0.42	0
CORN GRAIN	G	020	BU	BU	$/BU	89.00	9.40	80.10	0.02	0.30	0
	F	120	BU	BU	$/BU	89.00	9.40	80.10	0.02	0.30	0
CORN GROUND EAR CORN	G	021	CWT	CWT	$/CWT	86.00	8.00	72.20	0.04	0.27	0
	F	121	CWT	CWT	$/CWT	86.00	8.00	72.20	0.04	0.27	0
OATS GRAIN	G	022	BU	BU	$/BU	89.00	11.70	67.60	0.10	0.35	0
	F	122	BU	BU	$/BU	89.00	11.70	67.60	0.10	0.35	0
SORGHUM GRAIN	G	023	CWT	CWT	$/CWT	89.00	11.00	83.70	0.04	0.31	0
	F	123	CWT	CWT	$/CWT	89.00	11.00	83.70	0.04	0.31	0
WHEAT BRAN	G	024	CWT	CWT	$/CWT	89.00	16.00	63.20	0.14	1.17	0
	F	124	CWT	CWT	$/CWT	89.00	16.00	63.20	0.14	1.17	0

FEED INFORMATION

INGREDIENTS	CHECK	///	FEED SUPPLY RESTRICTIONS MORE THAN	FEED SUPPLY RESTRICTIONS LESS THAN	COST PER UNIT	NUTRIENT INFORMATION DRY MATTER (%)	TOTAL PROTEIN (%)	TOTAL DIGEST. NUTRI. (%)	CALCIUM (%)	PHOS-PHORUS (%)	VITAMIN A (IU/LB)
WHEAT GRAIN	G	025	BU	BU	$/BU	89.00	12.70	76.50	0.05	0.36	0
	F	125	BU	BU	$/BU	89.00	12.70	76.50	0.05	0.36	0
CORN(92.3%)-UREA(7.7%)	G	026	CWT	CWT	$/CWT	90.00	30.00	74.00	0.02	0.29	0
	F	126	CWT	CWT	$/CWT	90.00	30.00	74.00	0.02	0.29	0
CORN(88.6%)-UREA(11.4%)	G	027	CWT	CWT	$/CWT	90.00	40.00	71.00	0.02	0.28	0
	F	127	CWT	CWT	$/CWT	90.00	40.00	71.00	0.02	0.28	0
CORN(85.0%)-UREA(15.0%)	G	028	CWT	CWT	$/CWT	90.00	50.00	68.00	0.02	0.26	0
	F	128	CWT	CWT	$/CWT	90.00	50.00	68.00	0.02	0.26	0
CORN(81.3%)-UREA(18.7%)	G	029	CWT	CWT	$/CWT	90.00	60.00	65.00	0.02	0.25	0
	F	129	CWT	CWT	$/CWT	90.00	60.00	65.00	0.02	0.25	0
CORN(77.6%)-UREA(22.4%)	G	030	CWT	CWT	$/CWT	90.00	70.00	62.00	0.02	0.24	0
	F	130	CWT	CWT	$/CWT	90.00	70.00	62.00	0.02	0.24	0
LINSEED MEAL	G	031	CWT	CWT	$/CWT	91.00	35.13	70.07	0.40	0.83	0
	F	131	CWT	CWT	$/CWT	91.00	35.13	70.07	0.40	0.83	0
SOYBEAN MEAL	G	032	CWT	CWT	$/CWT	89.00	45.80	73.00	0.32	0.67	0
	F	132	CWT	CWT	$/CWT	89.00	45.80	73.00	0.32	0.67	0
BONE MEAL	G	033	CWT	CWT	$/CWT	96.00	12.10	15.20	29.00	13.50	0
	F	133	CWT	CWT	$/CWT	96.00	12.10	15.20	29.00	13.50	0
DICALCIUM PHOSPHATE	G	034	CWT	CWT	$/CWT	96.00	0.0	0.0	21.00	18.00	0
	F	134	CWT	CWT	$/CWT	96.00	0.0	0.0	21.00	18.00	0
GROUND LIMESTONE	G	035	CWT	CWT	$/CWT	96.00	0.0	0.0	35.00	0.0	0
	F	135	CWT	CWT	$/CWT	96.00	0.0	0.0	35.00	0.0	0
MONOSODIUM PHOSPHATE	G	036	CWT	CWT	$/CWT	96.00	0.0	0.0	0.0	25.00	0
	F	136	CWT	CWT	$/CWT	96.00	0.0	0.0	0.0	25.00	0

FEED INFORMATION

NGREDIENTS	CHECK	///	FEED SUPPLY RESTRICTIONS MORE THAN	LESS THAN	COST PER UNIT	NUTRIENT INFORMATION DRY MATTER (%)	TOTAL PROTEIN (%)	TOTAL DIGEST. NUTRI. (%)	CALCIUM (%)	PHOS- PHORUS (%)	VITAMIN A (IU/LB)
ODIUM TRIPOLYPHOSPHATE	G	037	CWT	CWT	$/CWT	96.00	0.0	0.0	0.0	25.00	0
	F	137	CWT	CWT	$/CWT	96.00	0.0	0.0	0.0	25.00	0
IT A PREMIX A	G	038	CWT	CWT	$/CWT	95.00	0.0	0.0	0.0	0.0	4540000
	F	138	CWT	CWT	$/CWT	95.00	0.0	0.0	0.0	0.0	4540000
IT A PREMIX B	G	039	CWT	CWT	$/CWT	95.00	0.0	0.0	0.0	0.0	9080000
	F	139	CWT	CWT	$/CWT	95.00	0.0	0.0	0.0	0.0	9080000
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						
RINT ADDITIONAL INGREDIENT IF NEEDED (SPECIFY UNITS)	G	///	AMOUNT	AMOUNT	$/UNIT						
	F	///	AMOUNT	AMOUNT	$/UNIT						

REPORT NO. 10001
DATE 12/21/70
BFR-70062

NAME
ADDRESS
CITY
STATE ZIP

THIS IS A PRELIMINARY RUN OF 'COMPUTERATIONS-BEEF'. THE FORMULAS AND DATA MANIPULATIONS, BASIC TO THE CALCULATIONS, ARE NOT COMPLETELY TESTED AS TO THEIR STABILITY AND VALIDITY. CONSIDER THESE FACTORS BEFORE INTERPRETTING THE INFORMATION IN THIS REPORT.

'COMPUTERATIONS-BEEF' DOES NOT CONSIDER:

1. FEED WASTAGE
2. GROWTH HORMONES
3. ANIMAL SHRINKAGE IN TRANSPORTING

EXHIBIT F

```
                          REPORT NO. 10001
                            ************
                            *          *
                            * RATION 1 *
                            *          *
                            ************
          BEST ESTIMATED RATION FORMULATION (WITH YOUR REQUIREMENTS)

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                  SECTION A.   COMPOSITION OF RATION 1
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

              INGREDIENT                            GROW     FINISH
              ----------                            PHASE    PHASE
                                                   ------   ------

                 ALFALFA HAY MID..........     0.00 %    5.78 %
                 ALFALFA HAY FULL.........     0.00 %    2.89 %
                 CORN SILAGE..............     0.00 %   61.71 %
                 CORN GRAIN...............    40.52 %   28.03 %
                 GROUND LIMESTONE.........     0.07 %    0.00 %
                *OATS SILAGE..............    55.60 %    0.00 %
                *4 X 4 BEEF SPECIAL.......     3.47 %    1.34 %
                 SALT.....................     0.34 %    0.25 %

                      COST ($) / 100 POUNDS.. 1.06       0.92

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
         SECTION B.   TOTAL INGREDIENT NEEDS FOR RATION 1         500 HEAD
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

    INGREDIENT                             GROW          FINISH          TOTAL
    ----------                             PHASE         PHASE           PERIOD
                                           ------        ------          ------

       ALFALFA HAY MID..........        0.00 TON      59.96 TON      59.96 TON
       ALFALFA HAY FULL.........        0.00 TON      29.98 TON      29.98 TON
       CORN SILAGE..............        0.00 TON     640.13 TON     640.13 TON
       CORN GRAIN...............     6507.26 BU    10384.30 BU    16891.56 BU
       GROUND LIMESTONE.........        6.30 CWT       0.00 CWT       6.30 CWT
      *OATS SILAGE..............      250.01 TON       0.00 TON     250.01 TON
      *4 X 4 BEEF SPECIAL.......       15.60 TON      13.90 TON      29.50 TON
       SALT.....................       30.58 CWT      51.87 CWT      82.45 CWT
```

```
                          REPORT NO. 10001
                            ************
                            *          *
                            * RATION 1 *
                            *          *
                            ************
          BEST ESTIMATED RATION FORMULATION (WITH YOUR REQUIREMENTS)

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
          SECTION C.   COST AND PERFORMANCE ESTIMATES FOR RATION 1
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

                                                     GROW    FINISH   TOTAL
     ESTIMATE                                        PHASE   PHASE    PERIOD
     --------                                        ------  ------   ------

       STARTING WEIGHT / HEAD (POUNDS).........        540     700      540
       FINAL WEIGHT / HEAD (POUNDS)............        700    1000     1000
       POUNDS OF GAIN / HEAD...................        160     300      460
       NUMBER OF DAYS ON RATION................         62     104      166
       AVERAGE POUNDS OF GAIN / HEAD / DAY.....       2.58    2.88     2.77
       COST OF FEED / HEAD ($).................      19.14   38.19    57.33
       NON-FEED FIXED COST / HEAD ($)..........       3.10    5.20     8.30
       FEED AND NON-FEED FIXED COST / HEAD($)..      22.24   43.39    65.63
       COST OF FEED / 100 POUNDS GAIN ($)......      11.96   12.73    12.46

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
          SECTION D.   COMPOSITION OF SUPPLEMENT PORTION OF RATION 1
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

                                                  GROW    FINISH
               INGREDIENT                         PHASE   PHASE
               ----------                         ------  ------

                   CORN GRAIN...............    91.25 %  94.64 %
                   GROUND LIMESTONE.........     0.16 %   0.00 %
                  *4 X 4 BEEF SPECIAL.......     7.82 %   4.52 %
                   SALT.....................     0.77 %   0.84 %

                        COST ($) / 100 POUNDS..  2.02      1.95


(1062668)
```

```
                              REPORT NO. 10001
                               ************
                               *          *
                               * RATION 1 *
                               *          *
                               ************
           BEST ESTIMATED RATION FORMULATION (WITH YOUR REQUIREMENTS)

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                SECTION E.   NUTRIENT ANALYSIS OF RATION 1
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

           NUTRIENT                                    GROW         FINISH
           --------                                    PHASE        PHASE
                                                       ------       ------
              DRY MATTER.......................  51.31 %       51.60 %
              TOTAL PROTEIN....................   6.05 %        5.82 %
              TOTAL DIGESTIBLE NUTRIENTS......  38.64 %       38.23 %
              CALCIUM..........................   0.21 %        0.23 %
              PHOSPHORUS.......................   0.21 %        0.16 %
              VITAMIN A........................   1388 IU/LB    2706 IU/LB
              SALT.............................   0.34 %        0.25 %

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
      SECTION F.   ESTIMATED POUNDS OF INTAKE PER HEAD PER DAY FOR RATION 1
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                           BODY       TOTAL        SUPPLEMENT
                            WEIGHT      RATION        PORTION
                           ------------------------------------

                            540 LBS.    25.3 LBS.    11.2 LBS.
                            600 LBS.    28.1 LBS.    12.5 LBS.
                            700 LBS.    32.8 LBS.    14.5 LBS.
  >>>START FINISHING PHASE>>>
                            700 LBS.    32.9 LBS.     9.7 LBS.
                            800 LBS.    37.6 LBS.    11.1 LBS.
                            900 LBS.    42.2 LBS.    12.5 LBS.
                           1000 LBS.    46.9 LBS.    13.9 LBS.
```

CONCLUSIONS

At the time of this writing, this portion of the project, Computer Applications to an Agricultural Management Problem is still not complete. It is undergoing test and modification to insure that it meets the criteria established prior to development.

Usefulness in educational programs for youth and adults is of primary concern. In the later stages of development, thirty-eight professional agriculturalists in education, banking, and extension were asked to pilot the use of ComputeRations-Beef in their home communities. The results of this pilot effort were in turn used to modify the input mechansim and to clarify the way in which the output can be used in an educational setting.

Evidence of the worth of this portion of the project will come as feedlot operators and educators begin to utilize the product of the developmental effort. Weighing the costs of use against the real or perceived benefits will determine if the idea of computer assisted management decision making will be adopted by farm operators and managers and can be useful in management education programs.

Should the ComputeRations-Beef program be of value, a major problem remains of maintenance of the program to provide good service to educators and feedlot operators or managers. The departments responsible for the development of the program are investigating several alternatives for continuing operation.

Dissemination of the announcement of the availability of the ComputeRations-Beef program will be made to all potential mid-west clients in education as soon as the program is perfected and a mechanism for operation identified.

APPENDIX A

FARMER'S HANDBOOK - MONTHLY SYSTEM

FARMER'S HANDBOOK

Introduction

The electronic processing of farm business records is not new. You have been selected and asked to participate in a University of Minnesota Department of Agricultural Education Research Project designed to evaluate methods of transmitting farm business information for electronic recording and analysis. The purpose of this Project is to evaluate the method of inputting information with the pbjective of helping farmers to improve the quality and usefulness of their business records.

Electronic processing systems do not make record keeping less demanding. They require as complete and as accurate information as the present MFAB system does if they are to give you useful information.

It is important that information sent to the Project Center is consistently described and arrives on a uniform schedule.

This handbook is designed to provide you, the record keeper with:

1. A timetable indicating when various reports are due, who is responsible for submitting the reports and when processed reports will be received from the Project Center.

2. Instructions, suggestions, and guidelines which will assist you in reporting information to the Project Center.

3. Realistic examples which will help you understand the reporting instructions.

This handbook should be put into the three-ring binder for future reference.

INPUT

Reports from Farmer

A. Monthly:

1. Receipts
2. Expenses
3. Capital Assest Depreciation Schedule Items
4. Feed Data Record
5. Record of Produce Used in Home

B. Semi-Annually:

1. Missing Data Request

C. Annually:

1. Adjustment for Tax Final
2. Tentative Depreciation Schedule (if necessary)
3. Inventory Information
4. Crop Production Report
5. End of Year Summary Data
6. Enrollment Record of Capital Assets (first year)

OUTPUT

Reports from AG.ED. Project Center

A. Monthly:

1. Detailed Transaction Summary
2. Enterprise Transaction Summary

B. Annually:

1. Tentative Depreciation Schedule
2. Tax Final Report
3. Investment Credit Report
4. Capital Asset-Depreciation
5. Annual Farm Business Analysis Report

Timetable for Reporting and Processing:

In order to provide timely reports to all farmers it is important that information be sent to The Project Center on schedule. This is necessary because various types of reports will be processed for all farm simultaneously. If a report is late from a farm, the processing will be done without the report. This farm will not receive a timely report in this case. No guarantee can be made that late information will be processed; in fact, you should assume it will not be done.

To prevent delayed reports or the possibility of not receiving a report, the following timetable is provided for your use. This timetable is in effect at the present time but is subject to change by the Project Director. You should review this timetable periodically to see that reports for your farm are sent in on schedule.

SCHEDULE	WHO	WHAT
At Enrollment	Farmer	Send agreement to participate to the Project Center
When Agreement is received	Project Center	Assign the Farm Number. Send the farmer a supply of necessary materials.
As soon as possible	Farmer	Complete and mail to the Project Center the Enrollment Record of Capital Assets.
As soon as possible after receipt of Enrollment Record of Capital Assets	Project Center	Mail two copies of Capital Asset-Depreciation Record to first year participants.

SCHEDULE	WHO	WHAT
January 1st	Farmer	Complete beginning inventories.
By 5th of each month	Farmer	Mail to the Project Center the following forms: 1. Receipts and Losses 2. Expenses 3. Capital Asset Transactions 4. Feed Data Record 5. Record of Produce Used in Home
By the _____ day of each month	Project Center	Mail to farmer the Monthly Enterprise Summary and Monthly Detailed Transaction Report.
June	Project Center	Mail two copies of Missing Data Request to farmer.
	Farmer	Return completed Missing Data Request to Project Center.
November - December	Project Center	Mail two copies of Tentative Depreciation Schedule to farmer.
December	Project Center	Mail to farmer: 1. Missing Data Request 2. Adjustment for Tax Final
December 30	Farmer	Mail to the Project Center: 1. Corrected Tentative Depreciation Schedule. 2. Missing Data Request.

SCHEDULE	WHO	WHAT
January 5th	Farmer	Mail to the Project Center the following information for December: 1. Monthly Receipts 2. Monthly Expenses 3. Monthly Transactions of Capital Asset Depreciation Schedule of Items PLUS 1. Adjustment for Tax Final 2. Ending Inventories 3. End of Year Summary Data 4. Crop Production Report
January - February	Project Center	Mail to farmer the following reports: 1. Tax Final Report 2. Investment Credit Report 3. Capital Asset-Depreciation Record
February - March	Project Center	Mail to farmer the Annual Farm Business Analysis Report.

There are five monthly input reports submitted to you. They are (1) the Monthly Receipts and Losses report, (2) the Monthly Expenses report, (3) the Monthly Capital Asset Transactions Depreciation Schedule Items report, (4) the Monthly Feed Record, and (5) the Monthly Record of Produce Used in Home. The carbon copies of these reports should be filed in your three-ring binder which then serves as a journal. Mail the original to the Project Center.

Monthly Receipts and Losses:

The Monthly Receipts form (example below) is for listing all income transactions. It is also used for reporting losses of capital assets such as cattle, machinery and buildings. Specific reporting instructions are found on the reverse side of the actual report form. All participants should study these instructions carefully. Describe each transaction completely and fully so the Project Center can classify it in the proper income tax category.

You must decide which enterprises you will use. The available enterprises are listed on the Farm Enterprise Codes--Form XI. Nine enterprises are non-farm enterprises. They are used for recording personal income, money received by borrowing or income from a business separate from farming. You must be careful to keep your farm receipts separate from other types of income. Choose enterprises carefully for the most meaningful reports and then be consistent in reporting.

Livestock transactions should be reported in one of the three areas provided for that purpose. You should indicate both quantity and number of head of purchased livestock held for Dairy, etc. (middle section of form).

Borrowed Funds: Report money borrowed.

In the enterprise column, indicate the "$ Borrowed" enterprise. In the item description, identify source of loan and items involved.

Provisions have been made for keeping the landlord share of the income separate from the operator share on the upper and lower section of the report; the column at the right side of the form "% LANDLORD INCOME" is used to indicate the per cent of the amount received that is to be credited to the landlord's account. The operator and landlord shares must be reported individually on the MIDDLE section of the report form. Indications of "O" for all transactions reported for the operator and "L" for all transactions for the landlord are necessary to allow calculation of (1) tax records for both the operator and the landlord and (2) complete farm business analysis information.

Non-Cash Transactions

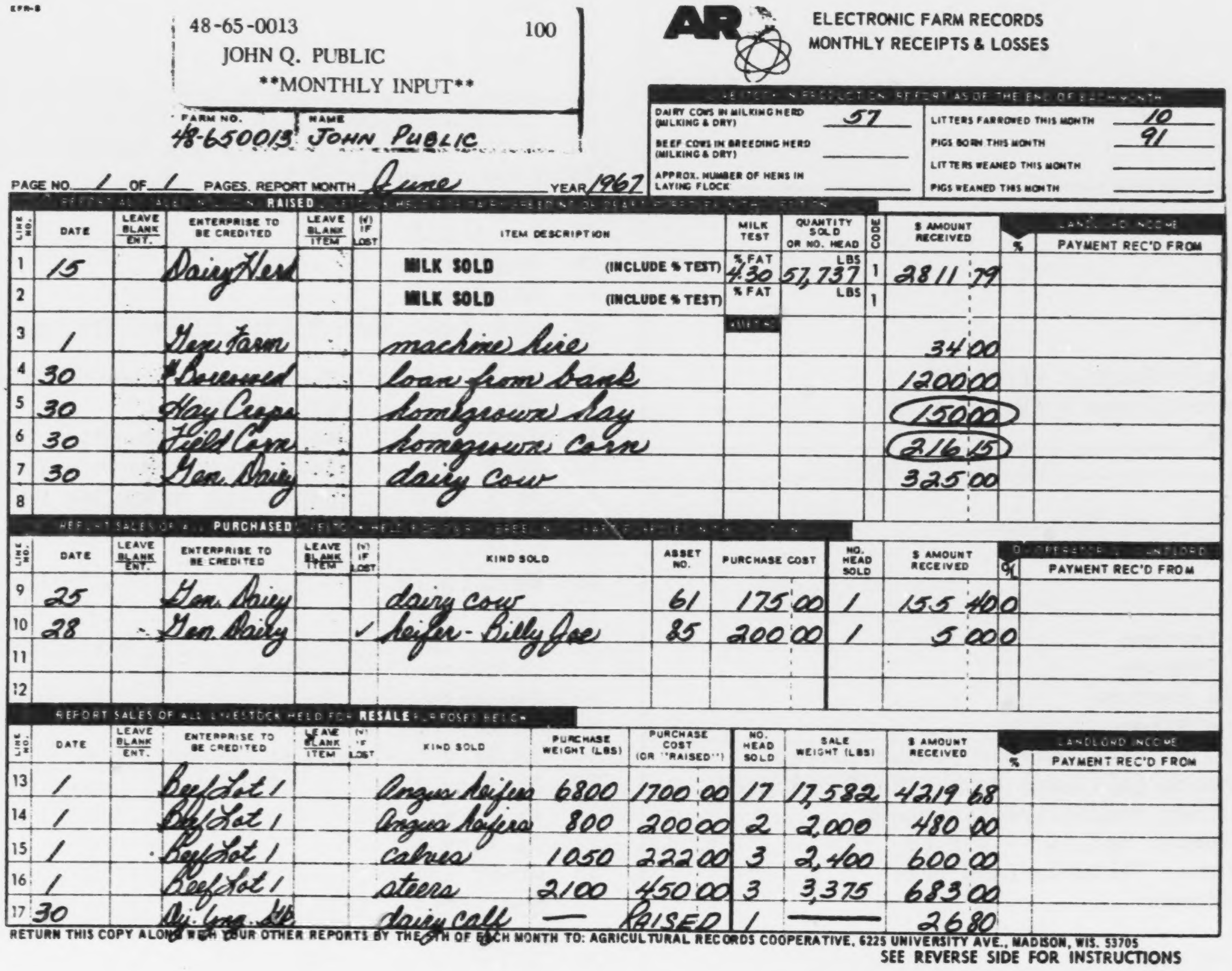
Non-cash transactions are those for which you do not make a cash outlay or receive cash, but where the item should be credited or debited to an enterprise. For example, home grown feed grain can be sold for cash or fed to livestock. By reporting the market value of home-raised feed consumed by a livestock enterprise, a farmer is able to more clearly determine the profit from this livestock enterprise as well as the profits from the various crop enterprises involved. The same reasoning applies to livestock enterprises when transfers are involved.

Reporting non-cash items requires extra care and awareness on your part. For convenience and consistency in reporting, you may want to group the non-cash items on the bottom of the form being used. You must circle the dollar amounts in the non-cash transactions. Non-cash transactions will be printed on the Detailed Transactions Reports under four item headings, "feed, crop, livestock, and other."

FARM ENTERPRISE CODES

	CROPS AND GENERAL
60	Corn Fodder
61	Field Corn
62	Oats
63	Barley
64	Wheat
65	Oat Silage
66	Flax
67	Rye
68	Soybeans
69	Corn Silage
71	Potatoes
72	Peas
73	Sweet Corn
74	Sunflowers
75	Hybrid Seed Corn
76	Sugar Beets
77	Other Cultivated Crops A (Fruits)
78	Other Cultivated Crops B (Vegetables)
79	Diverted Acres
80	Grass Seed
70	Legume Seed
81	Alfalfa Hay
82	Other Legume Hay and Mixtures
83	Tame Grass Hay
84	Annual Hay
85	Wild Hay
86	Alf. - Mixed Pasture
87	Other Legume Pasture
88	Other Tillable Pasture
89	Grass & Legume Silage
91	General Crops (All Crops - Undistributed)
92	General Livestock (All Livestock - Undistributed
94	Special A - Other Productive Livestock
95	Special B - Summer Fallow -- Tilled
96	Special C - Other Tillable Land Idle
97	Special D - Timber
98	Special E
99	Gen. Farm (General Farm - Undistributed)
000	Unstated (Do Not Use Without Clarification)
204	Other Business A
205	Other Business B
206	Other Business C

	LIVESTOCK	
11	Dairy Herd	(Milking Herd Only)
12	Dy Yng Stk	(Young Stock Only - Other Dairy)
13	Dairy 1	
14	Dairy 2	
15	Dairy 3	
16	Dairy 4	
19	Gen. Dairy	(All Dairy - Undistributed)
21	Hog Farrow	(Complete Hog Enterprise)
22	Finish Hogs	(Finishing Hog Enterprise)
23	Hogs - Weaning Pigs	
24	Hog Lot 1	
25	Hog Lot 2	
26	Hog Lot 3	
27	Hog Lot 4	
29	Gen. Hogs	(All Hogs - Undistributed)
31	Ewe Flock	
32	Lamb Feeders	(Fattening Operation Only)
39	Gen. Sheep	(All Sheep)
41	Beef Herd	(Beef Cows - Breeding Herd)
42	Beef Repl	(Beef Replacements - Young Stock)
43	Beef Feed	(Fattening Operation Only)
44	Beef Lot 1	
45	Beef Lot 2	
46	Beef Lot 3	
47	Beef Lot 4	
49	Gen. Beef	(All Beef - Undistributed)
51	Chickens	(Laying Flocks)
52	Broilers	
53	Turkey Poults	
54	Poultry 1 - Turkeys Laying Flock	
55	Poultry 2	
56	Poultry 3	
57	Poultry 4	
58	Other Poult	(Misc. Poultry - Ducks, Geese, Etc.)
59	Gen. Poult	(All Poultry - Undistributed)
183	$ Borrowed	
184	$ Borrowed A - Real Estate Mortgages	
185	$ Borrowed B - Chattel Mortgages	
186	$ Borrowed C - Notes	
187	$ Borrowed D - Accounts Payable	
170	Accounts Receivable	
193	Personal	



EFR-8

48-65-0013 100
JOHN Q. PUBLIC
MONTHLY INPUT

FARM NO. 48-650013
NAME JOHN PUBLIC

AR

ELECTRONIC FARM RECORDS
MONTHLY RECEIPTS & LOSSES

LIVESTOCK IN PRODUCTION REPORT AS OF THE END OF EACH MONTH

DAIRY COWS IN MILKING HERD (MILKING & DRY)	57	LITTERS FARROWED THIS MONTH	10
BEEF COWS IN BREEDING HERD (MILKING & DRY)		PIGS BORN THIS MONTH	91
APPROX. NUMBER OF HENS IN LAYING FLOCK		LITTERS WEANED THIS MONTH	
		PIGS WEANED THIS MONTH	

PAGE NO. 1 OF 1 PAGES. REPORT MONTH June YEAR 1967

[illegible] **RAISED** [illegible]

LINE NO.	DATE	LEAVE BLANK ENT.	ENTERPRISE TO BE CREDITED	LEAVE BLANK ITEM	(✓) IF LOST	ITEM DESCRIPTION	MILK TEST	QUANTITY SOLD OR NO. HEAD	CODE	$ AMOUNT RECEIVED	%	PAYMENT REC'D FROM
1	15		Dairy Herd			MILK SOLD (INCLUDE % TEST)	% FAT 4.30	LBS 57,737	1	2811 79		
2						MILK SOLD (INCLUDE % TEST)	% FAT	LBS	1			
3	1		Gen. Farm			machine hire				34 00		
4	30		#Borrowed			loan from bank				1200 00		
5	30		Hay Crops			homegrown hay				150 00		
6	30		Field Corn			homegrown corn				216 15		
7	30		Gen. Dairy			dairy cow				325 00		
8												

[illegible] **PURCHASED** [illegible]

LINE NO.	DATE	LEAVE BLANK ENT.	ENTERPRISE TO BE CREDITED	LEAVE BLANK ITEM	(✓) IF LOST	KIND SOLD	ASSET NO.	PURCHASE COST	NO. HEAD SOLD	$ AMOUNT RECEIVED	%	PAYMENT REC'D FROM
9	25		Gen. Dairy			dairy cow	61	175 00	1	155 400		
10	28		Gen. Dairy		✓	heifer - Billy Joe	85	200 00	1	5 000		
11												
12												

REPORT SALES OF ALL LIVESTOCK HELD FOR **RESALE** PURPOSES BELOW

LINE NO.	DATE	LEAVE BLANK ENT.	ENTERPRISE TO BE CREDITED	LEAVE BLANK ITEM	(✓) IF LOST	KIND SOLD	PURCHASE WEIGHT (LBS)	PURCHASE COST (OR "RAISED")	NO. HEAD SOLD	SALE WEIGHT (LBS)	$ AMOUNT RECEIVED	%	PAYMENT REC'D FROM
13	1		Beef Lot 1			Angus heifers	6800	1700 00	17	17,582	4219 68		
14	1		Beef Lot 1			Angus heifers	800	200 00	2	2,000	480 00		
15	1		Beef Lot 1			calves	1050	222 00	3	2,400	600 00		
16	1		Beef Lot 1			steers	2100	450 00	3	3,375	683 00		
17	30		Dy. Yng. Stk.			dairy calf	—	RAISED	1	—	26 80		

LANDLORD INCOME

RETURN THIS COPY ALONG WITH YOUR OTHER REPORTS BY THE [illegible]TH OF EACH MONTH TO: AGRICULTURAL RECORDS COOPERATIVE, 6225 UNIVERSITY AVE., MADISON, WIS. 53705

SEE REVERSE SIDE FOR INSTRUCTIONS

Monthly Expenses:

The Monthly Expenses report is for reporting only the monthly operating expenses. Expenses for capital assets (land, building, machinery, equipment, depreciable livestock, etc.) are to be reported on the form called Monthly Capital Asset Depreciation Schedule Items.

The same basic instructions apply to Monthly Expenses as to Monthly Receipts. Describe each expense so that it can be properly coded. Choose enterprises carefully and be consistent in reporting.

The item purchased should be described in detail. For example, if milker inflations were purchased, they should be described as such and not called "supplies." If some repair work consists of welding on a tractor drawbar, write "welding - tractor drawbar" not "repairs." In case of a tax audit, knowing exactly what was purchased without going to receipts and bills is extremely important and timesaving. In cases where several items are purchased in one transaction, it is advisable to list each item. A description such as "milker inflations - washing powder - scouring pads" is better than "supplies." You should be careful not to combine into one transaction unlike items such as gasoline and feed. Feel free to use as many lines as necessary to completely describe the expense.

Certain expenses are part farm and part personal. The entire amount may be reported monthly and adjusted at the end of the year when submitting the Adjustment for Tax Final form.

Crops that are purchased for feed will have to be charged to the crop enterprise involved. For example, corn purchased for feed will be charged to the corn enterprise. Then the corn enterprise will be credited for corn fed. Feed purchased as a complete ration will be charged to the livestock enterprise.

Specific reporting instructions are printed on the reverse side of the actual report forms.

Charge accounts: If you buy miscellaneous operating items on open charge accounts, report them as expenses when purchased. In the Person Paid column, write "charged." Later payments on these accounts should be reported as a debt payment using the $ Borrowed D Enterprise. (The cash method for income tax reporting necessitates the deductions of any such unpaid accounts from operating expenses at the end of the year.)

Debt payments: When reporting repayment of principal, use the appropriate $ Borrowed enterprise. Separate interest from principal whenever possible and charge interest to the appropriate farm or non-farm enterprise. If this cannot be done, describe the expenditure as "Debt Payment - Principal and Interest" using the appropriate $ Borrowed enterprise. It will be necessary to separate the amount of interest paid at the end of the year.

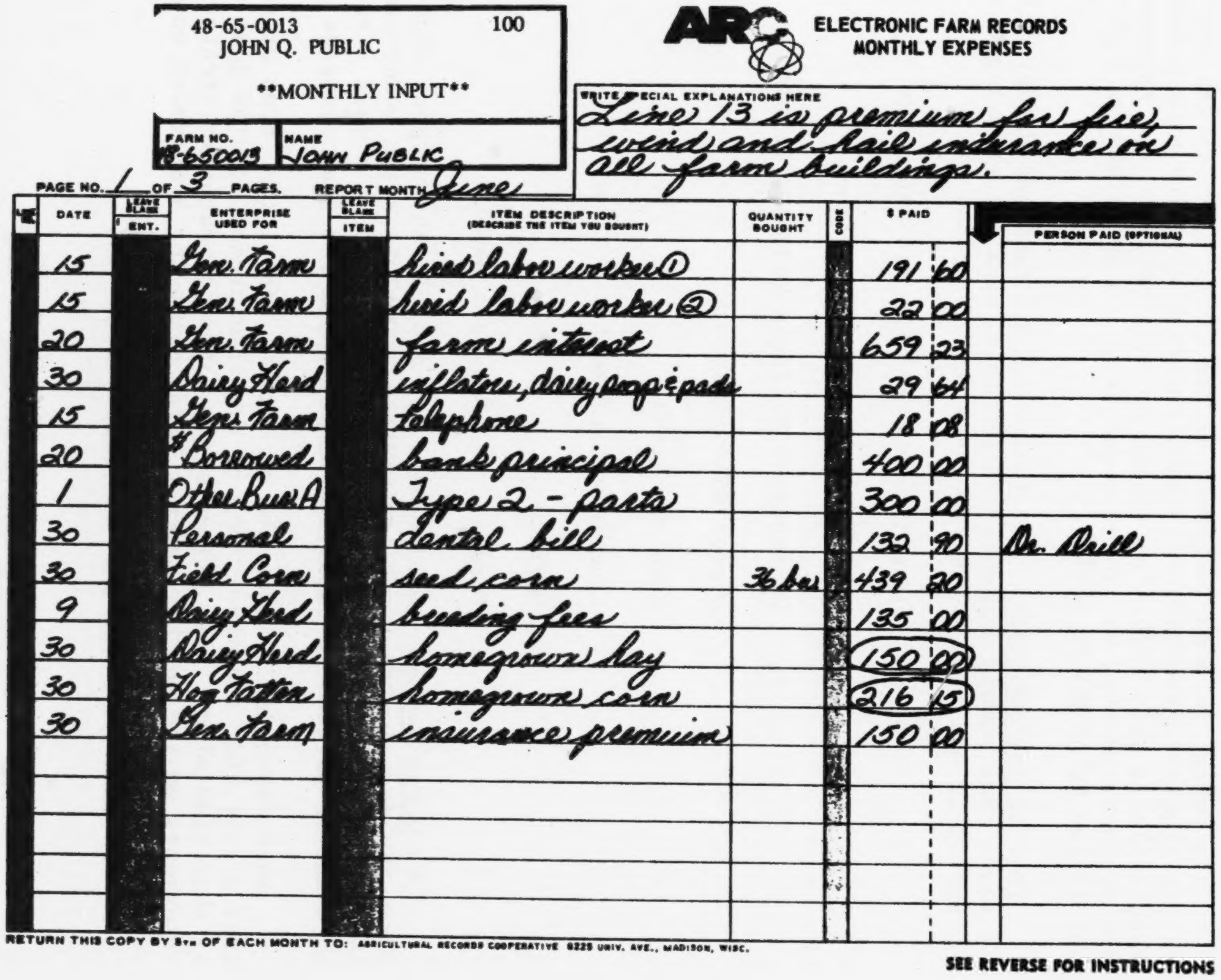
Down payments: The total cash cost of capital purchases is reported at the time acquired on the Monthly Capital Asset Transactions Form. Down payments are reported on the Monthly Expenses form. They are treated as debt repayments in the $ Borrowed enterprise you indicate.

NOTE: A capital asset transaction may involve the following:

Total cash cost - $5000 - Capital Assets form

Down payment $1000 - Monthly Expense form

$ Borrowed $4000 - Receipts form



48-65-0013 100
JOHN Q. PUBLIC

MONTHLY INPUT

FARM NO. 48-650013
NAME JOHN PUBLIC

ARC ELECTRONIC FARM RECORDS
MONTHLY EXPENSES

WRITE SPECIAL EXPLANATIONS HERE
Line 13 is premium for fire, wind and hail insurance on all farm buildings.

PAGE NO. 1 OF 3 PAGES. REPORT MONTH June

DATE	LEAVE BLANK ENT.	ENTERPRISE USED FOR	LEAVE BLANK ITEM	ITEM DESCRIPTION (DESCRIBE THE ITEM YOU BOUGHT)	QUANTITY BOUGHT	CODE	$ PAID	PERSON PAID (OPTIONAL)
15		Gen. Farm		hired labor worker ①			191 60	
15		Gen. Farm		hired labor worker ②			22 00	
20		Gen. Farm		farm interest			659 23	
30		Dairy Herd		inflations, dairy soap & pads			29 64	
15		Gen. Farm		telephone			18 08	
20		$ Borrowed		bank principal			400 00	
1		Other Bus. A		Type 2 - parts			300 00	
30		Personal		dental bill			132 90	Dr. Drill
30		Field Corn		seed corn	36 bu.		439 20	
9		Dairy Herd		breeding fees			135 00	
30		Dairy Herd		homegrown hay			(150 00)	
30		Hog Fatten		homegrown corn			(216 15)	
30		Gen. Farm		insurance premium			150 00	

RETURN THIS COPY BY 8TH OF EACH MONTH TO: AGRICULTURAL RECORDS COOPERATIVE 6225 UNIV. AVE., MADISON, WISC.

SEE REVERSE FOR INSTRUCTIONS

Monthly Transaction of Capital Asset Depreciation Schedule Items:

This report is used to report to the Project Center expenses for all capital assets (depreciable and non-depreciable). The same basic instructions apply to this report as to the Monthly Receipts and Expenses reports. Each transaction must be listed separately and described in such a manner that it can be coded properly.

Special Instructions. The following instructions differ from those on the form. You should indicate the proper Capital Asset Category in the Enterprise Column. The Categories are listed below:

Depreciable Machinery and Equipment

Land and Non-Depreciable Assets

Depreciable Building and Real Estate

Depreciable Livestock

Auto and Truck

Livestock Equipment

Dwelling

Personal and Non-Farm Assets

The Owner Numbers will be used for a different purpose than that for which the form instructions are written. DO NOT assign owner numbers. Report and identify landlords share as instructed. If more than one landlord and/or partner is involved, number these for your purposes (L1, L2....).

When depreciable items are purchased, report the "boot price" or cash cost at the time acquired. Report the transaction for the loan or charge at this time also. Down payments and later payments are treated as debt repayments on the Monthly Expense form, using the $ Borrowed enterprise description.

EFR-10

48-650013 100

JOHN Q. PUBLIC

MONTHLY INPUT

ELECTRONIC FARM RECORDS
MONTHLY CAPITAL ASSET
TRANSACTIONS
DEPRECIATION SCHEDULE ITEMS

DEPRECIATION METHOD CODES
0. STRAIGHT LINE
1. 20% PLUS STRAIGHT LINE
2. DOUBLE DECLINING BALANCE
3. 20% PLUS DBL. DECL. BAL.
4. SUM OF YEARS DIGITS
5. 20% PLUS SUM OF YEARS DIGITS
6. 1-½ DECLINING BALANCE
7. 20% PLUS 1-½ DECL. BAL.

FARM NO. 48-650013 NAME John Public

PAGE NO. 1 OF 1 PAGES. REPORT MONTH March YEAR 1967

LINE NO.	DATE	LEAVE BLANK ENT. CODE	ENTERPRISE TO BE CREDITED	LEAVE BLANK ITEM CODE	PROPERTY DESCRIPTION (RESTRICT TO 20 SPACES)	PURCHASE PRICE OR BOOT PAID		O-OPERATOR L-LANDLORD	OWNER NUMBER	SALVAGE VALUE		YEARS LIFE	METHOD DEPRECIATION	ASSET NO. OF ASSETS TRADED *PARTIAL TRADES (SEE REVERSE SIDE) 1ST	2ND	3RD	4TH	5TH	6TH	N-NEW U-USED	INVEST. CREDIT Y-YES N-NO
	20		Gen. Farm		USED ADDING MACHINE	35	00	0	1	—0—		6	0							U	Y
	20		Gen. Farm		D-14 PLOW	750	00	0	1	50	00	8	1	16	(34)					N	Y
	shar		l origin		st or basis of asset	34 to	apply			on new plow				is		$116.90					
	25		Gen. Dy.		500GAL BULK TANK 1/2	1500	00	L	7	150	00	15	0							N	Y
	25		Gen. Dy.		500GAL BULK TANK 1/2	1500	00	0	2	200	00	10	3	56						N	Y
	20		Gen. Hogs		HOG BARN REMODEL	1365	00	L	5	—0—		20	0							N	N
	30		Oth. Bus. A		FURNACE RENTAL PROP.	1200	00	L	9	—0—		15	0							N	Y

LINE NO.	DATE	LEAVE BLANK ENT. CODE	ENTERPRISE TO BE CREDITED	LEAVE BLANK ITEM CODE	NO. OF HEAD	PROPERTY DESCRIPTION (RESTRICT TO 20 SPACES)	PURCHASE PRICE OR BOOT PAID		O-OPERATOR L-LANDLORD	OWNER NUMBER	SALVAGE VALUE		YEARS LIFE	METHOD DEPRIN.	ASSET NO. OF ASSETS TRADED *PARTIAL TRADES (SEE REVERSE SIDE) 1ST	2ND	3RD	4TH	5TH	6TH	
			DAIRY																		
	15		Gen. Dy.		1	COW NO. 28	350	00	0	3	180	00	5	0							
	20		Gen. Dy.		1	DAIRY COW 80 1/2	150	00	0	3	50	00	4	0							
	20		Gen. Dy.		1	DAIRY COW 80 1/2	150	00	L	8	50	00	4	0							
	23		Gen. Hogs		10	BRED GILTS	700	00	0	4	350	00	3	0							
	27		Gen. Dy.		1	DAIRY CALF 85 1/2	50	00	0	3	50	00	7	0							
	27		Gen. Dy.		1	DAIRY CALF 85 1/2	50	00	L	8	50	00	7	0							

RETURN THIS COPY ALONG WITH YOUR OTHER REPORTS BY THE 5TH OF EACH MONTH TO: AGRICULTURAL RECORDS COOPERATIVE, 6225 UNIVERSITY AVE., MADISON, WIS. 53705

SEE REVERSE SIDE FOR INSTRUCTIONS

Livestock purchases (excluding feeder livestock) are reported on the lower section of the report. Feeder livestock purchases are considered operating expenses and as such, are reported on the Monthly Receipts Report at the time of sale. To prevent the loss of Feeder Livestock Purchase Information the Project Center would like you to also report this information as a Monthly Expense.

Record of Produce Used in Home:

The Record of Produce Used in Home is provided to allow you to record monthly the produce used in the home. You may substitute produce description. Note all values should be recorded to the nearest whole dollar. Please use the carbon paper to produce a copy for your records and send the original to the Project Center.

Monthly Feed Record:

The Monthly Feed Record information is used in determining feed expense for the various enterprises. This procedure will provide more realistic expense information in your enterprise statements. It will be reported as non-cash feed expense. Values should be reported to the nearest whole dollar.

Fa. No. ____________

Name ______________________________

RECORD OF PRODUCE USED IN HOME

Jan.	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

DESCRIPTION	QUANTITY	VALUE*		
		WHOLE FARM	OPER. SHARE	L. L. SHARE
WHOLE MILK	Quarts			
SKIM MILK	Quarts			
CREAM	Quarts			
CHICKEN EGGS	Dozen			
TURKEY EGGS	Dozen			
HONEY				
FRUIT				
VEGETABLES				
OTHER				

* Record all values to nearest whole dollar.

Form VII.

Farm No. ________ MONTHLY FEED RECORD Form IX.

Name ______________________________ Month ______________________________

ENTERPRISE	Corn		Oats		Barley		Wheat		Complete Rations		Protein, Salt, Min.		Legume Hay	
	Bu.	Value	Bu.	Value	Bu.	Value	Bu.	Value	Lbs.	Value	Lbs.	Value	Cwt.	Value
Dairy Cows														
Other Dairy														
Beef														
Hogs														
Sheep														

ENTERPRISE	Other Hay		Corn Silage		Grass Silage		Pasture		Whole Milk		Farm Prod. Skim Milk			
	Cwt.	Value	Cwt.	Value	Cwt.	Value	Days	Value	Lbs.	Value	Lbs.	Value		
Dairy Cows														
Other Dairy														
Beef														
Hogs														
Sheep														

Missing Information Request:

If you fail to report adequate information for coding and processing of receipt or expense transactions, the Project Center delays processing to notify you. At this time, you will receive a Missing Information Request stating the coding problem. It is important that you promptly return the form with the requested information so that your monthly report will be complete.

If you do not return the necessary information, a notation appears on the "Changes and Omissions" form informing both you and your Vo-Ag Instructor that the transaction has been ignored and it will be necessary for you to resubmit the transactions.

Changes and Omissions:

Occasionally it is necessary for the project Center to change or omit monthly transactions sent by the farmer. When this occurs, the Project Center attaches a "Changes and Omissions" form to the processed report to explain why this was necessary. The form is also used to notify you if you need to resubmit a transaction.

You should review your processed reports to see how they are affected by any changes made. If you do not agree with the change, inform the Project Center promptly.

Request for Corrections on Processed Reports:

At times, the farmer, Vo-Ag Instructor or Project Center may find that corrections are necessary on processed monthly reports. The Request for Correction form is to be used for making changes in processed monthly reports involving enterprises, $ amounts, item descriptions, etc.

If the Project Center finds an error in a processed report, they will use this form to explain to the farmer the change that is included in the monthly processed report he receives.

ELECTRONIC FARM RECORDS
TRANSACTION OMISSIONS - SEE EXPLANATION ON REVERSE SIDE

OMITTED TRANSACTIONS MUST BE RESUBMITTED

FARM NO. ____________________

NAME: ____________________

DATE: ____________________

BEFORE SUBMITTING

*	Retain for completing year-end data
**	Contact your fieldman for proper instructions
***	Review tax implications

REQUESTED ACTIVITY

+	Problem as coded and explained on reverse side must be COMPLETED
$	REPORT dollar amount
!	EXPLAIN item description
?	If a DUPLICATE transaction, do not resubmit

All transactions indicated below were omitted from the processing of your enclosed monthly reports. The codes entered in the omission code column indicate the reason for the omission. See detailed explanations for each code on the reverse side of this form

Omission Code Column	Report Month	Receipt & Loss	Capital Asset Item	Expense	Spec Attn	Needed Action	Page	Line	Other Comments

CHANGES

M. TRANSACTION HAS BEEN HANDLED AS:
  1. Total loss of asset.
  2. Complete sale of asset
  3. Asset ignored - does not appear on depreciation schedule
  4. Livestock held for RESALE.
  5. Livestock held for DAIRY, BREEDING OR DRAFT.
  6. Asset numbers are to be reported with the sale or loss of a purchased asset. Indicated asset number has beenused. (See comment)
  7. Purchase cost is to be reported with the sale or loss of a purchased asset. Indicated purchase cost has been used. (See comment)
  8. Livestock purchased for DAIRY, BREEDING OR DRAFT - Check the attached copy of the Monthly Capital Asset form for the information used.
  9. Home furnished for farm labor
  10. Personal dwelling
  11. Rental house
  12. Capital Asset Depreciation Item - Check the attached copy of the Monthly Capital Asset form for the information used. Complete missing data.
  13. Reported enterprise is not available. Indicated enterprise has been used. (See comment)
  14. Indicated Operator-Landlord designation has been used. (See comment)

N. TRANSACTION HAS BEEN CHANGED TO $ BORROWED TO SEPARATE THESE ITEMS FROM TAX ITEMS:
  1. Loans and accounts are not taxable income; down payments and time payments are not deductible farm operating expenses.
  2. Debt payments and down payments are not deductible operating expenses.

O. TRANSACTION HAS BEEN CHANGED TO OTHER BUSINESS TO KEEP SEPARATE NON-FARM ITEMS:
  1. When an item (other than livestock) is purchased for resale purposes, it is not a deductible farm operating expense and the resale of the item is not farm income.
  2. According to Internal Revenue Service, house rent is non-farm income.
  3. Other Business assets are recorded as DEPRECIABLE assets in Owner Group 9 to keep them separate from depreciation totals of the farm operation.

P. THE NON-CASH AREA OF REPORTING IS USED TO RECORD VALUES WHEN ACTUAL CASH IS IS NOT INVOLVED. IT IS RESERVED EXCLUSIVELY FOR FARM ENTERPRISES AND RECORDS THE USE OF HOME-GROWN FEEDS, FAMILY LABOR, TRANSFERRING ANIMALS FROM ONE LOT TO ANOTHER, ETC.

Q. THIS ITEM IS ELIGIBLE FOR INVESTMENT CREDIT.

R. PERSONAL ASSETS AND THEIR IMPROVEMENTS ARE RECORDED AS CAPITAL ASSETS IN OWNER GROUP 9 TO SEPARATE THEM FROM FARM ASSETS. THESE ITEMS ARE RECORDED AS NON-DEPRECIABLE PERSONAL EXPENSES

S. ENTERPRISE HAS BEEN CHANGED:
  1. Non-farm tax item
  2. Farm tax item.
  3. Original enterprise is inconsistent for analysis purposes.

T. OTHER
  1. Your detailed transaction and enterprise summary are enclosed, however, your expenses for this month were not received. Please sumbit with your next month's report, if necessary.
  2. Your detailed transaction and enterprise summary are enclosed; however, your receipts for this month were not received. Please submit with your next month's report if necessary.
  3. Apply this new supply of labels to properly identify your monthly input forms.
  4. Please report monthly the number of cows or hens involved in your operation.

ELECTRONIC FARM RECORDS

ORIGINAL REPORTED TRANSACTION HAS BEEN CHANGED

FARM NO.____________________________

NAME:______________________________

DATE:______________________________

If these transactions are not correct as changed, it will be necessary for member to submit a request for correction and to include more complete information for coded change reason. See change reason code column.

It has been necessary to change all transactions listed below because of tax or management implications. The code in the code column indicates the reason for change. See the detailed explanations for each code on the reverse side of this form.

FOLLOW ASTERICK INSTRUCTIONS BEFORE SUBMITTING SIMILAR TRANSACTIONS IF ASTERISKS APPEAR IN THE SPECIAL ATTENTION COLUMN BELOW.

** Contact your fieldman for proper instructions.

*** Review tax implications.

Change Code Column	Report Month	Receipt & Loss	Capital Asset Item	Expense	Spec Attn	Page	Line	Other Comments

OMISSION REASONS

A. REPORT $ AMOUNT INDICATED:
   1. Amount received
   2. Amount paid
   3. Boot price
   4. Original share of purchase price for traded portion of asset
   5. Purchase cost

B. EXPLAIN:
   1. Item description
   2. Operator-Landlord designation
   3. Owner group number
   4. Salvage value
   5. Years life
   6. Method of Depreciation
   7. Asset numbers of items traded
   8. New OR used
   9. Investment Credit Yes OR No
   10. Enterprise
   11. Raised
   12. Purchase cost
   13. Purchase weight
   14. Asset number
   15. Sale weight
   16. Number of head
   17. Lost or died
   18. Livestock held for DAIRY, BREEDING OR DRAFT
       OR
       Livestock held for RESALE

C. SEPARATE ITEMS AND DOLLAR AMOUNTS
   1. Unlike items must be separated for proper tax coding
   2. Separate enterprises for proper enterprise allocation.
   3. The amount received for each asset must be reported.
   4. Operator and landlord shares must be reported separately.

D. TRANSACTIONS APPEAR TO BE DUPLICATES BOTH HAVE BEEN OMITTED (List two transactions)

E. ALTERNATIVE METHODS OF REPORTING THIS TRANSACTION WILL AFFECT THE TAX CODE APPLIED TO IT. REVIEW THE ALTERNATIVES IN THE FARMER'S TAX GUIDE OR REVIEW WITH YOUR TAX CONSULTANT.

F. ACCUMULATE ALL BUILDING OR REPAIR COSTS UNTIL CONSTRUCTION IS COMPLETED. DEPRECIATION BEGINS WHEN BUILDING IS COMPLETE.

G. COMPLETE THE CIRCLED AREAS OF THE ATTACHED FORMS AND RESUBMIT WITH YOUR NEXT MONTHLY REPORT.

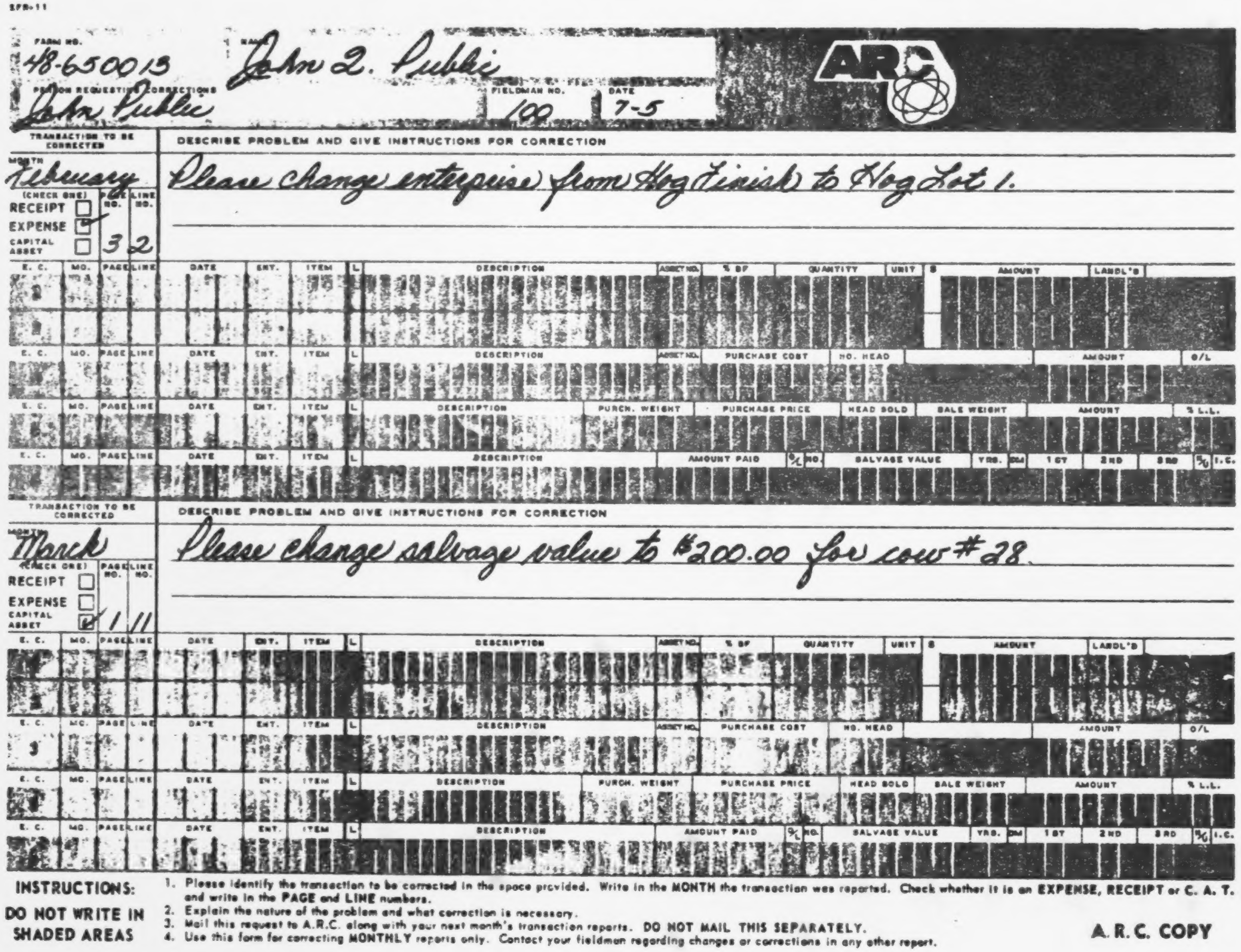
H. IF THE ASSET IS A TOTAL LOSS, RESUBMIT INDICATING TOTAL LOSS. It is not necessary to report insurance proceeds and replacement cost if the asset was not completely destroyed; the insurance proceeds and replacement cost should be used to determine the gains or losses, if any, at tax time. See the Farmer's Tax Guide, Pages 48 and 49. Use the Capital Asset Depreciation Record Adjustment Form to report to ARC any changes to assets on the Capital Asset Depreciation Schedule resulting from these gains or losses. This should be done at the time you file your taxes for the current year.

I. LOSSES OF RAISED LIVESTOCK HAVE NO TAX IMPLICATIONS, IF AN INSURANCE REIMBURSEMENT IS NOT INVOLVED. FOR THIS REASON, IT IS NOT NECESSARY TO REPORT THIS TYPE OF LOSS.

J. FEEDER LIVESTOCK PURCHASES ARE NOT TO BE REPORTED AT THE TIME OF PURCHASE. THESE VALUES ARE TO BE REPORTED AT THE TIME OF SALE USING THE APPROPRIATE COLUMNS ON THE RECEIPT & LOSS FORM.

K. TRANSACTION NOT CLEAR
   1. Debt payment or expense? If expense is reported at the time it occured, subsequent payments are reported as $ Borrowed transactions.
   2. Debt payment or purchase of capital asset? If a capital asset is reported at the time of purchase, subsequent payments are reported as $ Borrowed transactions.
   3. Home furnished for farm labor-OR-Personal dwelling-OR-Rental house?
   4. Capital purchase or expense? Resubmit on proper form
   5. Farm taxes, Personal taxes OR Labor withholding?
   6. Lease or conditional agreement to purchase?

L. CHECK YOUR CAPITAL ASSET DEPRECIATION RECORD THE ASSET NUMBER YOU INDICATED IS:
   1. A group of assets. If all assets were not sold/traded, only the proportionate purchase price of the asset sold/traded must be resubmitted.
   2. Not listed - resubmit correct asset number.
   3. Listed with a different purchase cost-resubmit correct purchase cost.



SFR-11

FARM NO. 48-650013

NAME John Q. Public

PERSON REQUESTING CORRECTIONS John Public

FIELDMAN NO. 100

DATE 7-5

TRANSACTION TO BE CORRECTED

MONTH February

(CHECK ONE)
RECEIPT ☐
EXPENSE ☑
CAPITAL ASSET ☐

PAGE NO. 3 LINE NO. 2

DESCRIBE PROBLEM AND GIVE INSTRUCTIONS FOR CORRECTION

Please change enterprise from Hog Finish to Hog Lot 1.

E. C.	MO.	PAGE	LINE	DATE	ENT.	ITEM	L	DESCRIPTION	ASSET NO.	% OF	QUANTITY	UNIT	$	AMOUNT	LANDL'D

E. C.	MO.	PAGE	LINE	DATE	ENT.	ITEM	L	DESCRIPTION	ASSET NO.	PURCHASE COST	NO. HEAD	AMOUNT	O/L

E. C.	MO.	PAGE	LINE	DATE	ENT.	ITEM	L	DESCRIPTION	PURCH. WEIGHT	PURCHASE PRICE	HEAD SOLD	SALE WEIGHT	AMOUNT	% L.L.

E. C.	MO.	PAGE	LINE	DATE	ENT.	ITEM	L	DESCRIPTION	AMOUNT PAID	%/L	NO.	SALVAGE VALUE	YRS.	DM	1ST	2ND	3RD	%/C	I.C.

TRANSACTION TO BE CORRECTED

MONTH March

(CHECK ONE)
RECEIPT ☐
EXPENSE ☐
CAPITAL ASSET ☑

PAGE NO. 1 LINE NO. 11

DESCRIBE PROBLEM AND GIVE INSTRUCTIONS FOR CORRECTION

Please change salvage value to $200.00 for cow #28.

E. C.	MO.	PAGE	LINE	DATE	ENT.	ITEM	L	DESCRIPTION	ASSET NO.	% OF	QUANTITY	UNIT	$	AMOUNT	LANDL'D

E. C.	MO.	PAGE	LINE	DATE	ENT.	ITEM	L	DESCRIPTION	ASSET NO.	PURCHASE COST	NO. HEAD	AMOUNT	O/L

E. C.	MO.	PAGE	LINE	DATE	ENT.	ITEM	L	DESCRIPTION	PURCH. WEIGHT	PURCHASE PRICE	HEAD SOLD	SALE WEIGHT	AMOUNT	% L.L.

E. C.	MO.	PAGE	LINE	DATE	ENT.	ITEM	L	DESCRIPTION	AMOUNT PAID	%/L	NO.	SALVAGE VALUE	YRS.	DM	1ST	2ND	3RD	%/C	I.C.

INSTRUCTIONS:

DO NOT WRITE IN SHADED AREAS

1. Please identify the transaction to be corrected in the space provided. Write in the **MONTH** the transaction was reported. Check whether it is an **EXPENSE, RECEIPT** or **C. A. T.** and write in the **PAGE** and **LINE** numbers.
2. Explain the nature of the problem and what correction is necessary.
3. Mail this request to A.R.C. along with your next month's transaction reports. **DO NOT MAIL THIS SEPARATELY.**
4. Use this form for correcting **MONTHLY** reports only. Contact your fieldman regarding changes or corrections in any other report.

A. R. C. COPY

APPENDIX B

FARMER'S HANDBOOK - CHECK SYSTEM

FARMER'S HANDBOOK

Introduction

The electronic processing of farm business records is not new. You have been selected and asked to participate in a University of Minnesota Department of Agricultural Education Research Project designed to evaluate methods of transmitting farm business information for electronic recording and analysis. The purpose of this Project is to evaluate the methods of inputting information with the objective of helping farmers to improve the quality and usefulness of their business records.

Electronic processing systems do not make record keeping less demanding. They require as complete and as accurate information as the present MFAB system does if they are to give you useful information.

It is important that information sent to the Project Center is consistently described and arrives on a uniform schedule.

This handbook is designed to provide you, the record keeper with:

1. A timetable indicating when various reports are due, who is responsible for submitting the reports and when processed reports will be received from the Project Center.
2. Instructions, suggestions, and guidelines which will assist you in reporting information to the Project Center.
3. Realistic examples which will help you understand the reporting instructions.

This handbook should be put into the three-ring binder for future reference.

INPUT

Reports from Farmer

A. Monthly:
  1. Voucher Copies for Checks and Deposits
  2. Miscellaneous Transaction Form
  3. Feed Data Record
  4. Record of Produce Used

B. Semi-Annually:
  1. Missing Data Request

C. Annually:
  1. Adjustment for Tax Final
  2. Tentative Depreciation Schedule (if Necessary)
  3. Inventory Information
  4. Crop Production Report
  5. End of Year Summary Data
  6. Enrollment Record of Capital Assets (first year)

OUTPUT

Reports from AG.ED. Project Center

A. Monthly
  1. Detailed Transaction Summary
  2. Enterprise Transaction Summary

B. Annually:
  1. Tentative Depreciation Schedule
  2. Tax Final Report
  3. Investment Credit Report
  4. Capital Asset-Depreciation Record
  5. Annual Farm Business Analysis Report

Timetable for Reporting and Processing:

In order to provide timely reports to all farmers it is important that information be sent to the Project Center on schedule. This is necessary because various types of reports will be processed for all farms simultaneously. If a report is late from a farm, the processing will be done without the report. This farm will not receive a timely report in this case. No guarantee can be made that late information will be processed, in fact, you should assume it will not be done.

To prevent delayed reports or the possibility of not receiving a report, the following timetable is provided for your use. This timetable is in effect at the present but is subject to change by the Project Director. You should review this timetable periodically to see that reports for your farm are sent in on schedule.

SCHEDULE	WHO	WHAT
At Enrollment	Farmer	Send agreement to participate to the Project Center
When agreement is received	Project Center	Assign the Farm Number. Assemble the necessary materials and send to farmer.
As soon as possible	Farmer	Complete and mail to the Project Center the Enrollment Records of Capital Assets.
As soon as possible after receipt of Enrollment Record of Capital Assets	Project Center	Mail two copies of the Capital Asset - Depreciation Record to first year participants.

SCHEDULE	WHO	WHAT
January 1st	Farmer	Complete beginning inventories.
By 5th of each month	Farmer	Mail to Project Center the following materials: 1. Voucher copies of checks and deposits 2. Miscellaneous Transactions Form 3. Feed Data Record 4. Record of Produce Used in Home
By the________ of each month	Project Center	Mail to farmer the Monthly Enterprise Transaction Summary and Monthly Detailed Transaction Report.
June	Project Center	Mail two copies of Missing Data Request to Farmer
	Farmer	Return completed Missing Data Request to Project Center
November - December	Project Center	Mail two copies of Tentative Depreciation Schedule to farmer.
December	Project Center	Mail to farmer: 1. Missing Data Request 2. Adjustment for Tax Final
December 20	Farmer	Mail to Project Center: 1. Missing Data Request 2. Corrected Tentative Depreciation Schedule

SCHEDULE	WHO	WHAT
January 5th	Farmer	Mail to the Project Center the following information for December: 1. Voucher copies 2. Miscellaneous Transaction Form 3. Feed Data Record 4. Record of Produce Used PLUS 1. Adjustment for Tax Final 2. Ending Inventory Information 3. End of Year Summary Data 4. Crop Production Report
January - February	Project Center	Mail to farmer the following reports: 1. Tax Final Report 2. Investment Credit Report 3. Capital Asset - Depreciation Record
February - March	Project Center	Mail to farmer the Annual Farm Business Analysis Report

There are four types of information reported monthly by you. These are (1) Voucher copies for deposits and checks, (2) the Miscellaneous Transactions form, (3) the Monthly Feed Data Record, and (4) the Monthly Record of Produce Used in Home. Remember, these input reports are the source of our output information. You will have to make carbon copies of these reports. The carbon copies should be filed for your future reference. Mail the original copies to the Project Center.

Voucher Copies for Checks and Deposits:

The voucher pads which you are to use are designed to serve two major functions: (1) to maintain your checking account information and (2) to provide detailed descriptions of the transactions which allow for the analysis of your farm business. We are not interested in your checking account balance or the method you use in balancing your account. You may prefer to enter the quantity in the + or - space and circle the appropriate sign (+ or -). If this system is to be efficient and effective, you must limit, preferably eliminate, cash transactions, and you must provide the supplementary information requested relevant to certain transactions.

Transaction Information

In supplying the Transaction Information, you must decide which enterprises you want to use. Only those listed on the Enterprise Form are available. Note non-farm enterprises are used for recording of personal income, money received by borrowing or income from a business separate from farming. Carefully choose your enterprises for the most meaningful reports and then be consistent when reporting. The Farm Enterprise Codes, Form XI, should be used as a guide.

The Item Description should be detailed and exact. For example, if milker inflations were purchased, they should be described as such and not called "supplies." If some repair work consists of welding on a tractor drawbar, write: "welding-tractor drawbar" not "repairs." In case of a tax audit, knowing exactly what was purchased without going to receipts and bills is extremely important and time saving. In cases where several items are purchased in one transaction, it is advisable to list each item. A description such as "milker inflations-washing powder-scouring pads" is much better than "supplies." Note that you must be sure to indicate separate dollar and cent amounts as veterinary supplies and feed supplements are involved in the same purchase. This procedure is equally important where two or more enterprises are involved in a transaction. Be sure to indicate the proper allocation of dollar and cent amounts to enterprises and categories within enterprises. Feel free to use as many lines as necessary. The

FARM ENTERPRISE CODES

CROPS AND GENERAL		LIVESTOCK	
60	Corn Fodder	11	Dairy Herd (Milking Herd Only)
61	Field Corn	12	Dy Yng Stk (Young Stock Only - Other Dairy)
62	Oats	13	Dairy 1
63	Barley	14	Dairy 2
64	Wheat	15	Dairy 3
65	Oat Silage	16	Dairy 4
66	Flax	19	Gen. Dairy (All Dairy - Undistributed)
67	Rye	21	Hog Farrow (Complete Hog Enterprise)
68	Soybeans	22	Finish Hogs (Finishing Hog Enterprise)
69	Corn Silage	23	Hogs - Weaning Pigs
71	Potatoes	24	Hog Lot 1
72	Peas	25	Hog Lot 2
73	Sweet Corn	26	Hog Lot 3
74	Sunflowers	27	Hog Lot 4
75	Hybrid Seed Corn	29	Gen. Hogs (All Hogs - Undistributed)
76	Sugar Beets	31	Ewe Flock
77	Other Cultivated Crops A (Fruits)	32	Lamb Feeders (Fattening Operation Only)
78	Other Cultivated Crops B (Vegetables)	39	Gen. Sheep (All Sheep - Undistributed)
79	Diverted Acres	41	Beef Herd (Beef Cows - Breeding Herd)
80	Grass Seed 70 Legume Seed	42	Beef Repl (Beef Replacements - Young Stock)
81	Alfalfa Hay	43	Beef Feed (Fattening Operation Only)
82	Other Legume Hay and Mixtures	44	Beef Lot 1
83	Tame Grass Hay	45	Beef Lot 2
84	Annual Hay	46	Beef Lot 3
85	Wild Hay	47	Beef Lot 4
86	Alf. - Mixed Pasture	49	Gen. Beef (All Beef - Undistributed)
87	Other Legume Pasture	51	Chickens
88	Other Tillable Pasture	52	Broilers
89	Grass & Legume Silage	53	Turkey Poults
91	General Crops (All Crops - Undistributed)	54	Poultry 1 - Turkeys Laying Flock
92	General Livestock (All Livestock - Undistributed)	55	Poultry 2
94	Special A - Other Productive Livestock	56	Poultry 3
95	Special B - Summer Fallow -- Tilled	57	Poultry 4
96	Special C - Other Tillable Land Idle	58	Other Poult (Misc. Poultry - Ducks, Geese, Etc.)
97	Special D - Timber	59	Gen. Poult (All Poultry - Undistributed)
98	Special E	183	$ Borrowed
99	Gen. Farm (General Farm - Undistrubuted)	184	$ Borrowed A - Real Estate Mortgages
000	Unstated (Do Not Use Without Clarification)	185	$ Borrowed B - Chattel Mortgages
204	Other Business A	186	$ Borrowed C - Notes
205	Other Business B	187	$ Borrowed D - Accounts Payable
206	Other Business C	170	Accounts Receivable
		193	Personal

Item Description is not who was paid. Note the shaded area under Item Description is designed to remind you to include the number of head of livestock involved in the transaction.

The Quantity column should be used to record weights, volumes and so on. Again the shaded area is used as a reminder to indicate the units--please be consistent in assigning units within enterprises.

For those persons involved in partnerships or operating under share rental agreements the Landlord Share column isprovided to allow for the separation of operator and whole farm information. Where it is appropriate for your business, indicate the landlords dollar share of the transportation item. If your check for fertilizer for the corn grain enterprise is $1000 and represents 50 per cent of the cost, enter LLd. fertilizer in Item Description column, the quantity, and $1000 in the LLd Share column indicating his share of the fertilizer. The same procedure applies to deposit transactions involving related shares. See the purchase example below.

No.	Date	Check Issued To	Amount		Deposit		Past Balance	
1	3/24	Farmers Elevator	1000	00			2300	00
					+ or -		1000	00
					Current Bal.		1300	00

Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
Corn Grain	6-24-24 Fertilizer	25,000 lbs.			$1000	00
	LLd Share	25,000 lbs.	$1000	00		

Farm No.__________

Certain expenses are part farm and part personal. The entire amount may be reported monthly and adjusted at the end of the year when submitting the Adjustment for Tax Final form.

Special Reporting Instructions:

Milk Sales: Report the percent of butterfat in the Item Description. List the gross sales value in the $ Amount column. Immediately below the original line breakout the deductions listing the appropriate enterprise, Item Description and so on using as many lines as necessary. See the example below.

No.	Date	Check Issued To	Amount		Deposit		Past Balance	
	3/26	Milk Check			813	00	1300	00
					+ or -		813	00
					Current Bal.		2113	00

Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
Dairy Cows	Milk 3.5%B.F.	20,000 lbs.			860	00
Dairy Cows	Milk Hauling				30	00
Dairy Cows	Washing Powder				1	80
Personal	Butter & Milk				15	20

Farm No.____________

Livestock Sales: The description of a livestock sale must be detailed to allow proper Tax Accounting. The problem of gross sales also is involved. The following reporting procedure should be followed.

1. Enter enterprise, head, description, quantity and unit, and gross dollar amount as the first line of the Transaction Information.

2. List the following information, if appropriate, on the next line:

   a. Held for dairy, breeding, draft or resale. When dairy, breeding or draft animals are held for less than 12 months, indicate "less than 12."

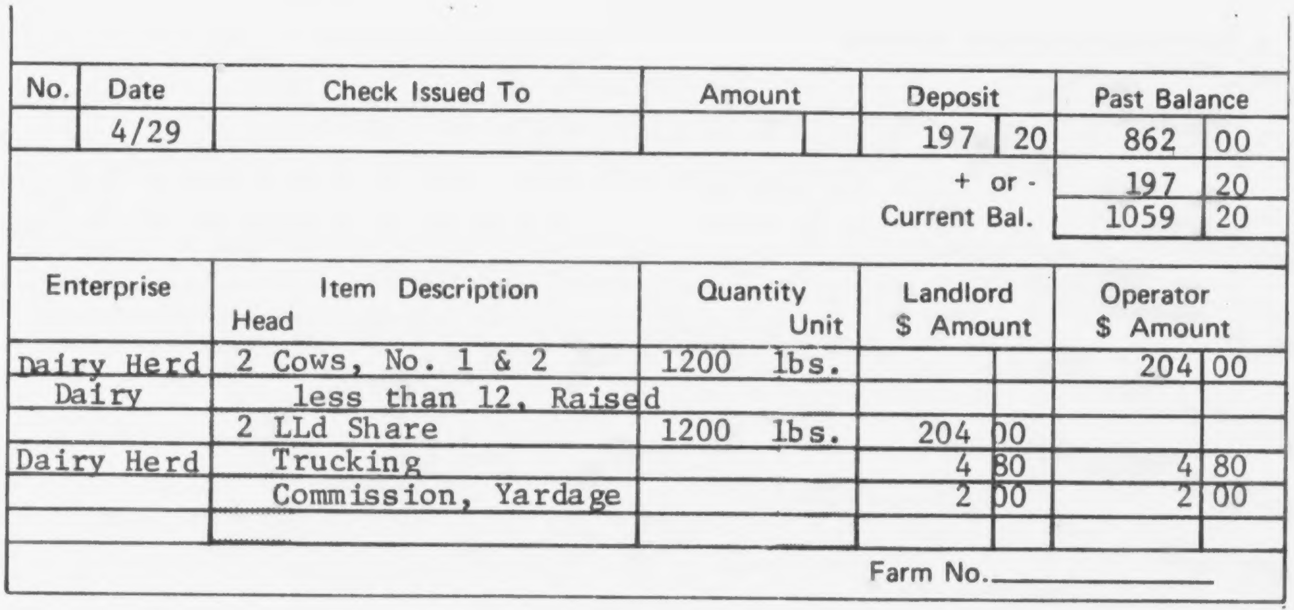
   b. Raised or purchased. If purchased, list original cost, original weight and asset number.

3. If a Landlord share is involved indicate LLd. share in Item Description column, the Quantity and LLd. Amount.

4. Break out the deductions as illustrated in the Milk sales example. If LLd. Share is involved, list the LLd. share

in the LLd. Amount column. If LLd. quantity information is relevant, use two lines for each item of expense.

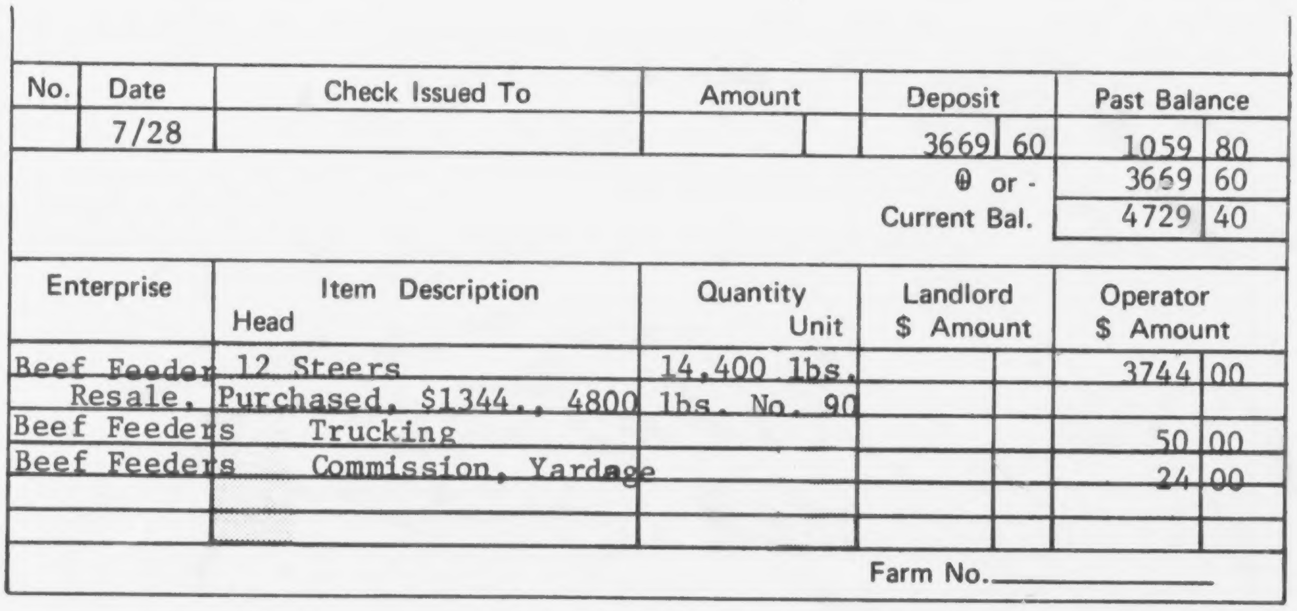
See illustrations below.



No.	Date	Check Issued To	Amount		Deposit		Past Balance	
	4/29				197	20	862	00
					+ or -		197	20
					Current Bal.		1059	20

Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
Dairy Herd	2 Cows, No. 1 & 2	1200 lbs.			204	00
Dairy	less than 12, Raised					
	2 LLd Share	1200 lbs.	204	00		
Dairy Herd	Trucking		4	80	4	80
	Commission, Yardage		2	00	2	00

Farm No.____________



No.	Date	Check Issued To	Amount		Deposit		Past Balance	
	7/28				3669	60	1059	80
					⊕ or -		3669	60
					Current Bal.		4729	40

Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
Beef Feeder	12 Steers	14,400 lbs.			3744	00
Resale,	Purchased, $1344., 4800	lbs. No. 90				
Beef Feeders	Trucking				50	00
Beef Feeders	Commission, Yardage				24	00

Farm No.____________

No.	Date	Check Issued To	Amount		Deposit		Past Balance	
	7/29				116	50	4729	40
					[✓ +] or -		116	50
					Current Bal.		4845	90

Enterprise	Head	Item Description	Quantity	Unit	Landlord $ Amount		Operator $ Amount	
Dairy Herd	1	Bossey	700	lbs.			119	00
Dairy, Purchased, $275, 1400 lbs. No. 86								
		LLd Share	700	lbs.	119	00		
Dairy Herd		Trucking			2	50	2	50

Farm No.______________

Crops that are purchased for feed will have to be charged to the crop enterprise involved. For example, corn purchased for feed will be charged to the corn enterprise. Then the corn enterprise will be credited for corn fed. Feed purchased as a complete ration will be charged to the livestock enterprise.

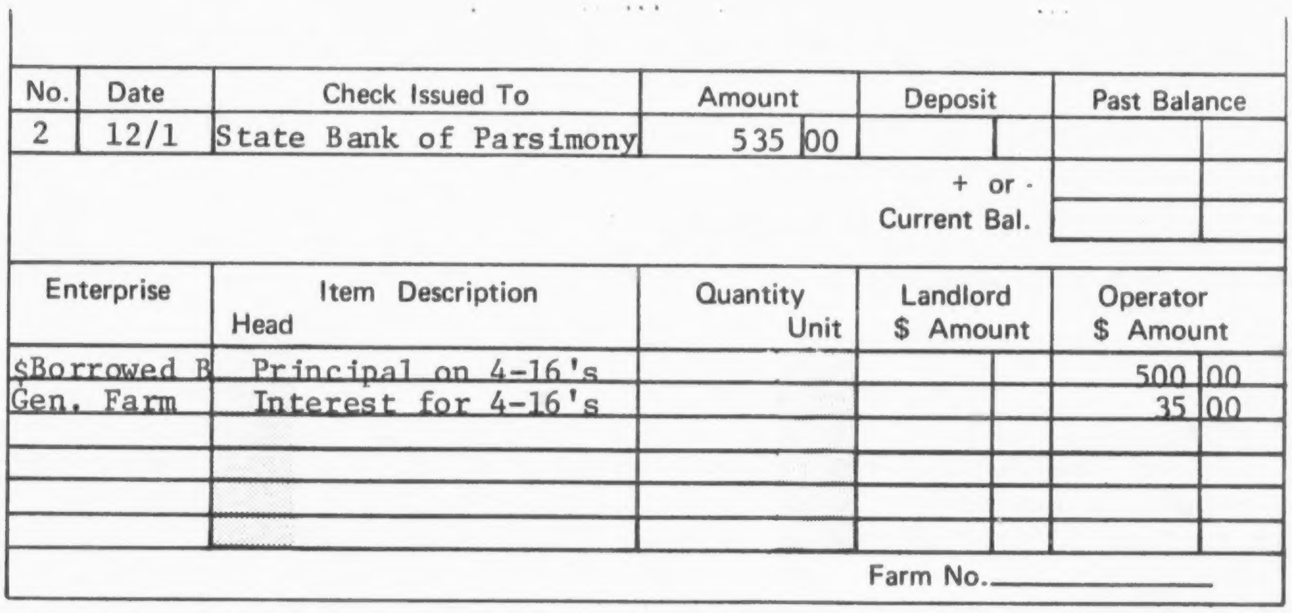
Money Borrowed: If money is borrowed, it should be reported when deposited as a receipt to a $ Borrowed enterprise. Decide which enterprise to use and include the descriptive information necessary to identify the loan. Charge accounts are explained below. See illustration below.

No.	Date	Check Issued To	Amount		Deposit		Past Balance	
	12/1				1000	00		
					+ or -			
					Current Bal.			

Enterprise	Head	Item Description	Quantity	Unit	Landlord $ Amount		Operator $ Amount	
$ Borrowed	A	From State Bank of Parsimony for fertilizer					1000	00

Farm No.______________

Debt Payments: Whrn reporting repayment of principal use the $ Borrowed enterprise (s). Separate interest from principal whenever possible and charge interest to the appropriate farm or non-farm enterprise. See illustration below. If this cannot be done, describe the expenditure as "Debt Payment - Principal and Interest" using the $ Borrowed Enterprise. This will make it necessary to separate the amount of interest paid at the end of the year.



No.	Date	Check Issued To	Amount		Deposit		Past Balance	
2	12/1	State Bank of Parsimony	535	00				
					+ or -			
					Current Bal.			

Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
$Borrowed B	Principal on 4-16's				500	00
Gen. Farm	Interest for 4-16's				35	00

Farm No.__________

Capital Asset Depreciation Schedule Items

An item purchased on credit can be depreciated as full purchase cost starting the date it is put into use. For example, an item purchased with a down payment and the balance to be paid periodically should be reported under Transaction Information at the full purchase cost when received. This will require the report of Money Borrowed or an increase in accounts payable.

Report only the total cost of a building at the time it is completed and ready for use. The date a building is completed and ready for use is the date to report for the date acquired. Depreciation is taken starting with this date.

If two or more parties purchase an asset together list each owner's share. Identify each landlord or partner (L1, L2,....) for your future information. This does not apply if the other owner is not involved in your farm operation; for example, a neighbor.

Do not combine assets purchased at one time. For example, a tractor and manure loader should appear as two transactions with the proper allocation of purchase price established for each item.

Specific Instructions

Be sure to enter the day and month the item was purchased or put into use.

In the Enterprise column enter the Capital Asset Category which is appropriate:

Depreciable Machinery and Equipment

Land and Non-Depreciable Assets

Depreciable Buildings and Real Estate Improvements

Auto and Truck

Livestock Equipment

Dwelling

Personal and Non Farm Assets

Depreciable Livestock

The Item Description printed out on the Capital Asset Depreciation Schedule is limited to 20 spaces. Record your share (1/2, 1/4, etc.) as part of this description. Livestock, particularly cows should be reported individually, to prevent later problems when selling an individual animal. If a group of animals is reported, later sales of individuals will be handled at a value representing the average of the group.

In the Quantity column indicate volumes and the appropriate unit. If an auto or a truck is purchased, indicate the fractional or percentage value for the farm share in this column.

In the $ Amount column report the full purchase price of an outright purchase or the boot price of a trade. Sales tax may be included in the purchse or boot price or you may elect to report it separately. If you elect to report Sales tax separately, in the $ Amount column on the line below the original price entry, WRITE TAX and the Sales tax involved. Do the same for the LLd $ Amount column. In the examples below the sales tax has been reported separately.

Use additional lines as necessary to report the following information relative to the purchase.

1. $ Amount of Salvage Value: Enter estimated value at time of disposal. Livestock or items not depreciated should be assigned a salvage value equal to the purchase price or basis.

2. Years of Life: Specify number of expected years of life. Check the Internal Revenue Service guidelines.

3. Method of Depreciation: See depreciation methods listed below. You will have the opportunity to make changes or corrections before you report an item to the Internal Revenue Service.

Straight line	Sum of years digits
20% plus straight line	20% plus sum of years digits
Double declining balance	1 1/2 declining balance
20% plus double declining balance	20% plus 1 1/2 declining balance

4. Asset Numbers of items traded in on new assets: Report the asset number from the Capital Asset Depreciation Record. If the item traded in represents only a partial share of a group on the depreciation schedule, Circle the asset number. Use the following line to report the cost or basis of the remaining grouped assets which is to be allocated to the asset or share traded off.

5. New or Used: Indicate if the purchased asset is new or used.

6. Eligible for investment credit: Indicate Yes I.C. or No I.C. If in doubt, consult with your Vo-Ag instructor or tax consultant.

7. Repeat the necessary information for other operator's or landlord's shares. Write LLd. Share or partnership share in the Item description, his appropriate quantity and $ Amount. Report only the detailed information which is different for this owner. It will be assumed that landlords Salvage value equals operator's and so on unless it is listed as being different.

Note the examples below:

No.	Date	Check Issued To	Amount		Deposit		Past Balance	
	11/1/68	John Brown	154	50				
					+ or -			
					Current Bal.			

Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
Dep. Lvstk.	1/2 Ada No. 63	600 lbs.			150	00
$150. Salvage	5 yr life St.Line				Tax 4	50
	1/2 LLd. Share	600 lbs.	150	00		
			Tax 4	50		

Note: $ Amount $150 minus $150 salvage = 0 Depreciation

Farm No. ________

No.	Date	Check Issued To	Amount		Deposit		Past Balance	
	8/15/68	Farer's Supply	772	50				
					+ or -			
					Current Bal.			

Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
Dep. Mach.	1/2 C. Picker 2 Row				750	00
$100 Salvage, 10 yrs. life, 20% plus St. Line, Asset #51					Tax 22	50
new, Yes	I.C.					
	1/2 Ptnr. 1 share		750	00		
			Tax 22	50		

Farm No.____________

No.	Date	Check Issued To	Amount		Deposit		Past Balance	
		Oliver Dealer	3360	00				
					+ or -			
					Current Bal.			

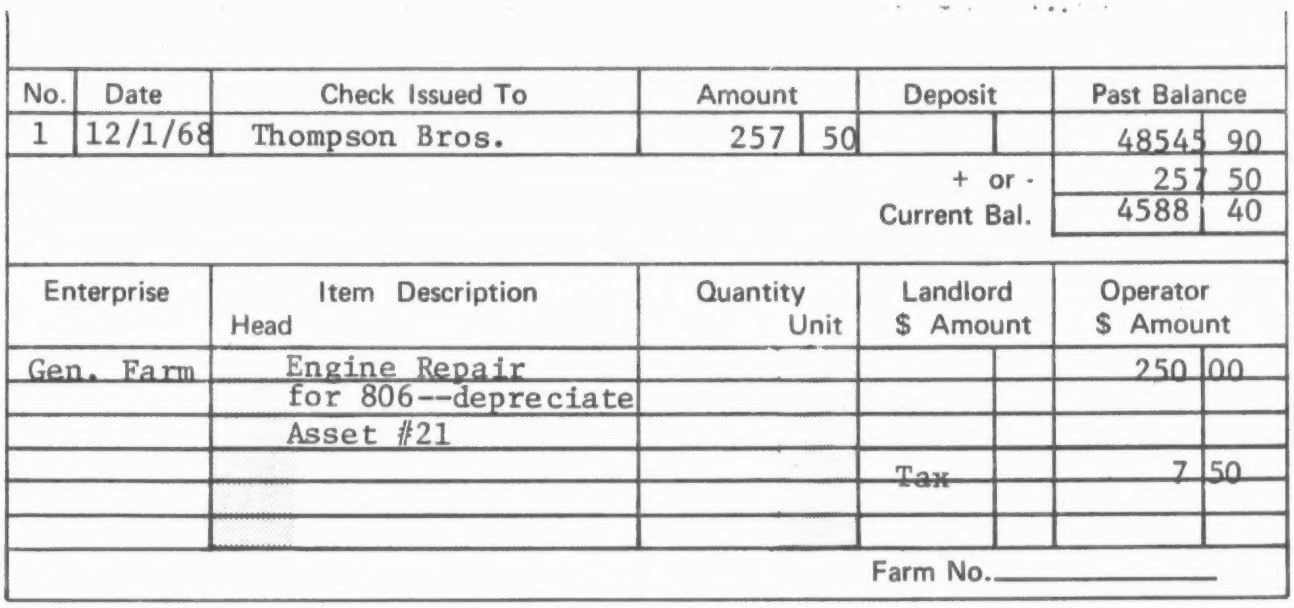
Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
Dep. Mach.	Oliver 2040				12,000	00
$1000 Salvage Value, 10 yrs. life, St. Line, Asset #5 Tax					360	00
New, Yes	I.C.					

Farm No.____________

Note-------the $9000 difference after the down payment must appear as a loan or charge account in a $ Borrowed Enterprise.

Major Repairs and Machine Overhauls: Normal repairs and maintenance costs are deductible expenses--the year of payment. Major overhauls and improvements which increased the life of machinery and buildings should be depreciated. When reporting depreciable expenses of this kind, write Depreciate with the item description. List the asset number to which the value is added.

See illustration below:



No.	Date	Check Issued To	Amount		Deposit		Past Balance	
1	12/1/68	Thompson Bros.	257	50			48545	90
					+ or -		257	50
					Current Bal.		4588	40

Enterprise	Item Description Head	Quantity Unit	Landlord $ Amount		Operator $ Amount	
Gen. Farm	Engine Repair				250	00
	for 806--depreciate					
	Asset #21					
			Tax		7	50

Farm No.____________

Miscellaneous Transaction Form

It is best to avoid cash transactions whenever possible with this system. Of course, it is necessary to report cash transactions which do not involve checks or deposits. The Miscellaneous Transaction Form is designed to handle Cash Expenses and Receipts in the same general manner as the voucher system. The instructions given for the voucher entries will apply to this form also. Please indicate the month and the sheet number for the month. A few special entries will also be handled on this form.

Losses or Deaths of Purchased Animals: Check the Lost Column and supply the general information. Be sure to report original cost, original weight, and asset number. If a grouping of animals in involved, the fractional share of weight and cost, can be calculated based upon the original asset purchase description.

Charge Account Transactions: The transactions involved in charge accounts must be identified as accurately as cash or check purchases if your record is to be accurate. Describe the transaction as you would for a check or cash purchase being as detailed as necessary. Check the Charge Column and indicate the $ Borrowed Enterprise. Later payments on these accounts should be reported as debt payments using the appropriate $ Borrowed Enterprise. (Unpaid accounts must be deducted from expenses at the end of the year for cash method of tax accounting.)

Farm No. ________ Month ____________

Name ______________________ Sheet No. ________

MISCELLANEOUS MONTHLY TRANSACTIONS

MONTHLY CASH EXPENSES

Date	Enterprise	Head	Item Description	Quantity	Unit	Landlord $ Amount		Your $ Amount		Charge $ Borrowed

MONTHLY CASH RECEIPTS AND LOSSES

Date	Enterprise	Head	Item Description	Quantity	Unit	Landlord $ Amount		Your $ Amount		Lost

Non-Cash Transactions: Non-cash items are those for which the farmer does not make a cash outlay or receive cash, but where the item should be credited or debited to the enterprise. For example, home grown feed grain can be sold for cash or fed to livestock. By reporting the market value of home-raised feed consumed by a livestock enterprise, a farmer is able to more clearly determine the profit from this livestock enterprise as well as the profits from the various crop enterprises involved. The same reasoning applies to livestock enterprises when transfers are involved.

Reporting non-cash items requires extra care and awareness on your part. For convenience and consistency in reporting, you may want to group the non-cash items on the bottom of the section of the Miscellaneous Monthly Transactions form. In all cases you must circle the dollar amounts in the non-cash transactions. Non-cash transactions will be printed on the Detailed Transactions Report under four item headings, "feed, crop, livestock, and other."

Record of Produce Used in Home

The Record of Produce Used in Home is provided to allow you to record monthly the produce used in the home. You may substitute produce description. Note all values should be recorded to the nearest whole dollar. Please use the carbon paper to produce a copy for your records and send the original to the Project Center.

Monthly Feed Record

The Monthly Feed Record information is used in determining feed expense for the various enterprises. This procedure will provide more realistic expense information in your enterprise statements. It will be reported as non-cash feed expense. Values should be reported to the nearest whole dollar.

Fa. No. ____________

Name ________________________________

RECORD OF PRODUCE USED IN HOME

Jan.	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

DESCRIPTION	QUANTITY	VALUE*		
		WHOLE FARM	OPER. SHARE	L. L. SHARE
WHOLE MILK	Quarts			
SKIM MILK	Quarts			
CREAM	Quarts			
CHICKEN EGGS	Dozen			
TURKEY EGGS	Dozen			
HONEY				
FRUIT				
VEGETABLES				
OTHER				

* Record all values to nearest whole dollar.

Form VII.

Farm No. ________ MONTHLY FEED RECORD Form IX.

Name ______________________________ Month ______________________

ENTERPRISE	Corn		Oats		Barley		Wheat		Complete Rations		Protein, Salt, Min.		Legume Hay	
	Bu.	Value	Bu.	Value	Bu.	Value	Bu.	Value	Lbs.	Value	Lbs.	Value	Cwt.	Value
Dairy Cows														
Other Dairy														
Beef														
Hogs														
Sheep														

ENTERPRISE	Other Hay		Corn Silage		Grass Silage		Pasture		Whole Milk		Farm Prod. Skim Milk			
	Cwt.	Value	Cwt.	Value	Cwt.	Value	Days	Value	Lbs.	Value	Lbs.	Value		
Dairy Cows														
Other Dairy														
Beef														
Hogs														
Sheep														

Name________________________________ Farm No.____________________

REQUESTS FOR CORRECTIONS -- CHECK SYSTEM

Month originally reported__________________.

Details of original voucher:

No.	Date	Check Issued To	Amount	Deposit	Past Balance
				+ or -	
				Current Bal.	
Enterprise		Item Description Head	Quantity Unit	Landlord $ Amount	Operator $ Amount
				Farm No.__________	

Describe problem and give instructions for corrections.

____

____

____

Month originally reported__________________.

Details of original voucher:

No.	Date	Check Issued To	Amount	Deposit	Past Balance
				+ or -	
				Current Bal.	
Enterprise		Item Description Head	Quantity Unit	Landlord $ Amount	Operator $ Amount
				Farm No.__________	

Describe problem and give instructions for corrections.

____

____

____

5

APPENDIX C

CAPITAL ASSET ENROLLMENT

Enrollment Record of Capital Assets

This form has three purposes: (1) to gather information for the Capital Asset Depreciation Record, (2) to determine the farmer's investment in his operation, and (3) to provide the farmer with a single listing of all capital assets along with purchase dates, cost and amount of depreciation taken. Both depreciable and non-depreciable capital assets should be listed.

A. The following types of assets should be reported for accurate tax and management records:

1. Land and non-depreciable assets (including operator's house).
2. Depreciable buildings and real estate improvements.
3. Depreciable machinery, equipment and major overhauls.
4. Depreciable livestock (animals purchased for dairy, breeding or draft purposes).

B. Instructions:

1. Mail the original copy to the Project Center as soon as possible. Keep the carbon copy in your notebook.
2. Write your Name and Farm Number in the space provided.
3. Enter the current tax year at the top of the form.
4. Enter the page number in the space provided.
5. Enter the Owner Group Number in the space provided. Use separate pages for different Owner Group Numbers. If this space is left blank, it will be assumed that assets listed on the sheet belong in Owner Group No. 1.

   Nine Owner Group numbers are available. Subtotals showing the depreciation of each Owner Group will be reported on the Capital Asset-Depreciation Record. Owner Group No. 9 is reserved for Non-Farm assets.

   The purpose of the Owner Group number is to designate different Capital Asset Categories by owner. The Owner Group Numbers are assigned as indicated in the table on the following page.

Owner	Capital Asset Category	Owner Group Number
Operator	Depreciable Machinery and Equipment	1
	Land and Non-Depreciable Assets	1
	Depreciable Buildings and Real Estate Improvements	1
	Depreciable Livestock	1
Operator	Auto and Truck-Farm Share	2
Operator	Livestock Equipment	3
Landlord	Depreciable Machinery and Equipment	4
	Land and Non-Depreciable Assets	4
	Depreciable Building and Real Estate Improvements	4
	Depreciable Livestock	4
Landlord	Auto and Truck-Farm Share	5
Landlord	Livestock Equipment	6
Operator	Personal and Non-Farm Assets	9
	This includes the following:	
	House-Operator's	9
	House-Landlord's	9

6. Combining of assets should be avoided. List each machine or farm building separately. Do the same for all livestock. Having each asset listed separately will make it easier to indicate trades, sales, and losses in the future.

7. Report only the farm share of the automobile. For example, if an auto was purchased for $3,000 and is being used one-half for farm business, describe the item as "Auto, 1/2 farm" with a cost of $1,500.

8. Do not list raised animals.

9. List all depreciable assets. If the farmer does not want an asset to be depreciated, a salvage value equal to the cost or the depreciated balance should be reported. (See example form).

C. These instructions apply to each column on the form.

1. Leave the first two shaded columns blank. They are for use in assigning asset numbers and category coding.

2. Property Description: Identify the property in this column. Make the description clear enough to insure correct classification of the asset. Limit the description to 20 spaces.

Include any fractional part owned as part of the item description. For example, a one-third interest in a corn picker might be described as "Corn Picker 1/3." Please do not use the % sign in the description. Remember to list each asset separately. Do not lump or group assets.

3. Date: Enter the month, day and year the asset was acquired. For example, enter 7/13/58 for an item purchased July 13, 1958. If the month and/or day is unknown, leave blank, however, the year must be reported. All assets purchased during the current tax year are to be reported on a monthly basis. Do not report these assets on the Enrollment Record of Capital Assets.

4. Cost or Basis: Write in the dollars and cents. For non-depreciable assets enter the amount paid. For depreciable assets specify the original basis for depreciation purposes. This is the cash boot paid plus the undepreciated balance and salvage value of any trade-ins and minus any extra first-year depreciation taken. An entry is required in this column for every asset listed.

5. Salvage Value: Write in the dollar amount. A salvage value must be reported when the Declining Balance method of depreciation is used. For other methods of depreciation leave blank if no salvage value is to be reported. Salvage can be specified at this time even though it has not been used in computing depreciation in the past. If salvage value is established at this time, the "remaining balance" figure should be reduced by this amount.

   Important: Enter a salvage value equal to cost or basis for all non-depreciable assets and those assets you do not want depreciated.

6. Years Life: Enter the total number of years this asset is to be depreciated not just the years remaining. Do not use fractional numbers such as 33 1/3 or percentages. This column is left blank for land and non-depreciable assets.

7. Undepreciated Balance: Enter the depreciation left at the beginning of the year of enrollment.

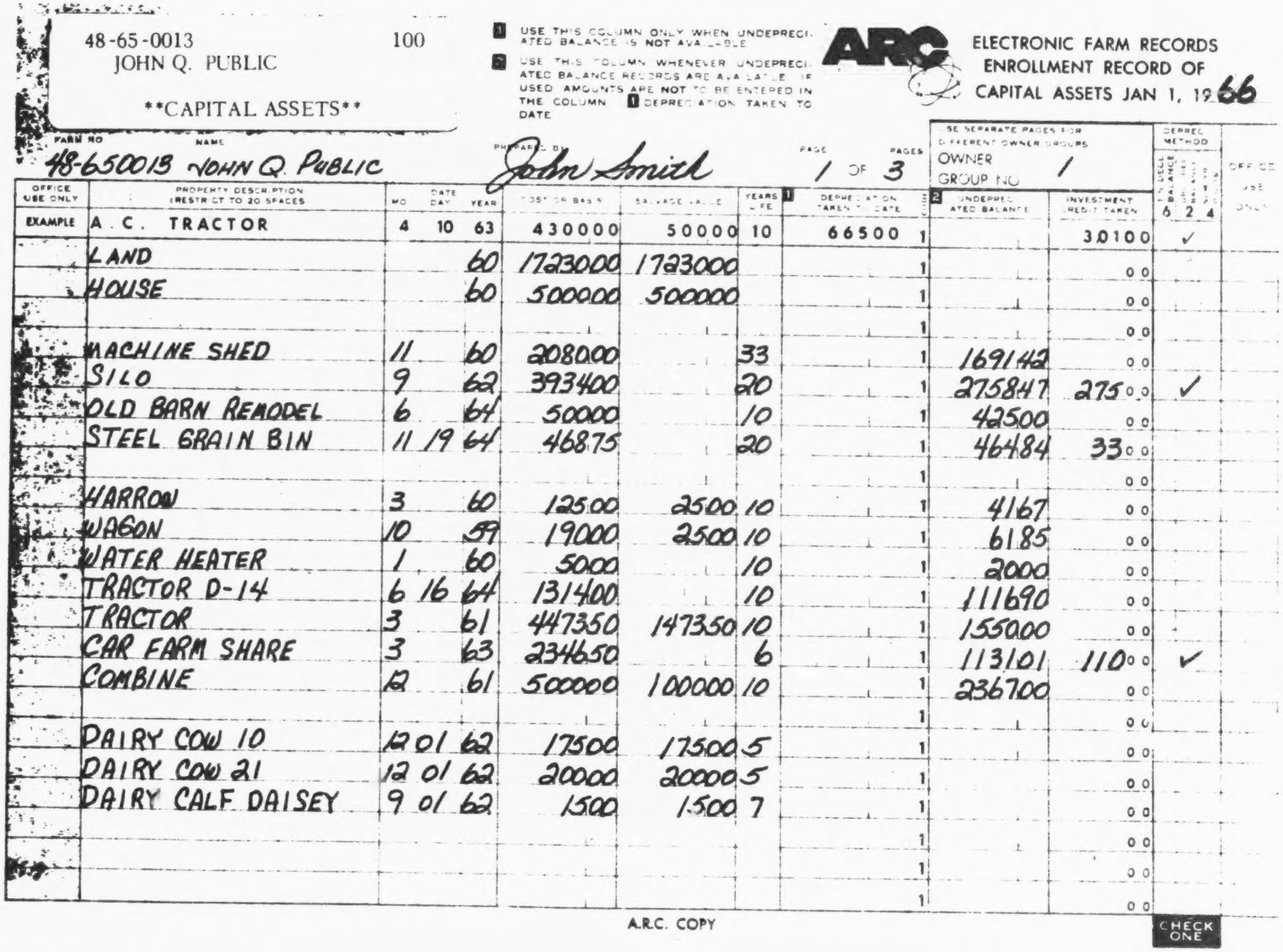
   Note: In the process of transferring your depreciation schedule information, be sure to subtract the salvage value of the item from the "Cost Remaining Beginning of the Year." (1969).

   Place a "0" (zero) in the Undepreciated Balance column if the asset is fully depreciated.

   Do Not Use the Depreciation Taken To Date column on this form.

8. Investment Credit Taken: Enter the amount of any Investment Credit that has been taken. Report it to the nearest dollar only.

9. Depreciation Method: If Straight Line is the depreciation method for the asset, the column should be left blank; otherwise, the appropriate method should be checked.



48-65-0013 100
JOHN Q. PUBLIC

CAPITAL ASSETS

1 USE THIS COLUMN ONLY WHEN UNDEPRECIATED BALANCE IS NOT AVAILABLE

2 USE THIS COLUMN WHENEVER UNDEPRECIATED BALANCE RECORDS ARE AVAILABLE. IF USED AMOUNTS ARE NOT TO BE ENTERED IN THE COLUMN 1 DEPRECIATION TAKEN TO DATE

ARC ELECTRONIC FARM RECORDS
ENROLLMENT RECORD OF
CAPITAL ASSETS JAN 1, 1966

FARM NO 48-650013 NAME JOHN Q. PUBLIC

PREPARED BY John Smith

PAGE 1 OF 3 PAGES

USE SEPARATE PAGES FOR DIFFERENT OWNER GROUPS
OWNER GROUP NO 1

OFFICE USE ONLY	PROPERTY DESCRIPTION (RESTRICT TO 20 SPACES)	DATE MO	DATE DAY	DATE YEAR	COST OR BASIS	SALVAGE VALUE	YEARS LIFE	1 DEPRECIATION TAKEN TO DATE	CODE	2 UNDEPRECIATED BALANCE	INVESTMENT CREDIT TAKEN	DEPREC METHOD 6 2 4	OFFICE USE ONLY
EXAMPLE	A. C. TRACTOR	4	10	63	430000	50000	10	66500	1		30100	✓	
	LAND			60	1723000	1723000			1		00		
	HOUSE			60	500000	500000			1		00		
									1		00		
	MACHINE SHED	11		60	208000		33		1	169142	00		
	SILO	9		62	393400		20		1	275847	275 00	✓	
	OLD BARN REMODEL	6		64	50000		10		1	42500	00		
	STEEL GRAIN BIN	11	19	64	46875		20		1	46484	33 00		
									1		00		
	HARROW	3		60	12500	2500	10		1	4167	00		
	WAGON	10		59	19000	2500	10		1	6185	00		
	WATER HEATER	1		60	5000		10		1	2000	00		
	TRACTOR D-14	6	16	64	131400		10		1	111690	00		
	TRACTOR	3		61	447350	147350	10		1	155000	00		
	CAR FARM SHARE	3		63	234650		6		1	113101	110 00	✓	
	COMBINE	12		61	500000	100000	10		1	236700	00		
									1		00		
	DAIRY COW 10	12	01	62	17500	17500	5		1		00		
	DAIRY COW 21	12	01	62	20000	20000	5		1		00		
	DAIRY CALF DAISEY	9	01	62	1500	1500	7		1		00		
									1		00		
									1		00		
									1		00		

A.R.C. COPY

CHECK ONE

AR 48-650013 JOHN Q. PUBLIC
ROUTE 1 BOX 13
ALFALFADALE, WI 53210

CAPITAL ASSETS · DEPRECIATION RECORD
AS OF DECEMBER 31, 1967
COMPILED BY AGRICULTURAL RECORDS COOPERATIVE

DEPT. OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

DATE PROCESSED 1-15-68 FLOMAN 100

ASSET NO.	QTY.	ASSET DESCRIPTION	DATE ACQUIRED	COST OR OTHER BASIS	SALVAGE VALUE	YEAR LIFE	DEPRECIATION TAKEN THIS YEAR	REMAINING BALANCE			COMMENTS
LAND AND NON-DEPRECIABLE ASSETS*											
78	1	LAND	60	17230.00	17230.00						
MACHINERY AND EQUIPMENT											
1	1	WAGON	10 00 61	190.00	25.00	10	16.50	61.85	S.L.		
2	1	HARROW	3 00 62	125.00	25.00	10	10.00	41.67	S.L.		
3	1	MILKER	1 00 62	2867.41	367.41	10	250.00	1000.00	S.L.		
6	1	WATER HEATER	1 00 62	50.00	.00	10	5.00	20.00	S.L.		
7	1	SPRAYER	1 00 62	75.00	15.00	10	6.00	24.00	S.L.		
	1	MILL	1 00 62	100.00	.00	10	.63	25.00	S.L.		TRADED ON 79
10	1	OFFICE EQUIPMENT	7 00 62	164.50	14.50	10	15.00	67.50	S.L.		
13	1	M UNITS	1 00 63	251.50	51.50	10	20.00	100.00	S.L.		
14	1	CLEANER	2 00 63	1320.00	20.00	10	130.00	661.00	S.L.		
15	1	BLADE	7 00 63	100.00	80.00	10	10.00	55.00	S.L.		
16	1	UNLOADER	10 00 63	925.00	125.00	10	80.00	460.00	S.L.		
17	1	WATER SYSTEM	11 00 65	231.37	.00	20	11.57	204.37	S.L.		
19	1	CHEVY TRUCK	12 00 60	1983.90	200.00	5		.00	S.L.		
20	1	WELDER	1 00 55	220.00	.00	5		.00	S.L.		
21	1	SAW AND MOTOR	1 00 59	114.00	.00	5		.00	S.L.		
22	1	MOWER 1/2	1 00 55	46.00	.00	5		.00	S.L.		
23	1	HAND SAW	1 00 60	82.00	.00	5		.00	S.L.		
24	1	BALER	7 00 60	1400.00	.00	10	52.85	211.39	DDB		
25	1	CHOPPER	1 00 60	862.00	.00	10	44.89	179.54	DDB		
26	1	HAY-O-VATOR	7 00 60	100.00	.00	5		.00	S.L.		
27	1	WAGON	9 00 60	170.00	.00	10	17.00	45.34	S,L.		
29	1	DRILL	4 00 61	345.00	145.00	10	20.00	65.00	S.L.		
30	1	MOWER	4 28 66	144.00	.00	10	14.41	121.27	S.L.		
31	1	SPRAYER	4 10 66	136.50	.00	10	13.65	114.89	S.L.		
32	1	MILERS	8 17 66	536.65	.00	10	53.67	465.10	S.L.		
34	1	D-14 TRACTOR	6 16 66	1314.00	.00	10	131.40	1116.90	S.L.		
37	1	UNLOADER	9 10 64	1775.00	.00	10	217.10	868.38	DDB	124	
38	1	FARROWING CRATE	12 16 64	699.41	.00	10	91.09	364.37	DDB	49	
39	1	MANURE SPREADER	1 00 64	679.20	79.20	10	72.29	289.15	DDB	48	
40	1	HEATER	7 00 64	281.70	.00	10	50.71	202.82	DDB	20	
1	'	HOG WATER	11 14 66	401.00	.00	10	40.10	357.56	S.L.		
42	1	WAGON BOX	4 00 65	131.50	.00	10	13.15	96.95	S.L.	9	
43	1	WAGON	11 00 65	237.50	.00	10	23.75	186.69	S.L.	17	

A.R 48-650013 JOHN Q. PUBLIC

CAPITAL ASSETS DEPRECIATION RECORD

AS OF **DECEMBER 31, 1967**

COMPILED BY AGRICULTURAL RECORDS COOPERATIVE

DEPT OF AGRICULTURAL ECONOM
UNIVERSITY OF WISCONSIN
COOPERATING

DATE PROCESSED **1-15-68** **FLOMAN 100**

							DEPRECIATION TAKEN THIS YEAR	REMAINING BALANCE			COMMENTS
MACHINERY AND EQUIPMENT											
44	1	RAKE	8 00 65	475.00	75.00	10	82.19	328.75	DDB	33	
45	1	DISC	12 00 65	350.00	.00	10	62.51	250.05	DDB	25	
48	1	PRESSURE PUMP	6 00 66	100.00	.00	10	10.00	85.00	S.L.		
52	1	HEATER	1 15 66	60.00	.00	10	6.00	48.00	S.L.		
53	1	CONDITIONER	12 00 63	700.00	100.00	10	60.00	355.00	S.L.		
54	1	MOWER	12 00 63	400.00	50.00	10	35.00	207.00	S.L.		
55	1	TRACTOR	3 00 63	4473.50	1473.50	10	300.00	1550.00	S.L.		
56	1	TANK	11 00 63	2428.50	428.00	10	200.00	1170.00	S.L.		
57	1	A C TRACTOR	1 00 56	2729.00	.00	10		.00	S.L.		
58	1	COMBINE	12 00 63	5000.00	1000.00	10	400.00	2367.00	S.L.		
59	1	CAR FARM SHARE	3 00 65	2346.50	.00	6	565.50	1131.01	DDB	110	
72	1	PUMP	1 00 62	200.00	25.00	10	17.50	70.00	S.L.		
73	1	PUMP	1 00 62	200.00	25.00	10	17.50	70.00	S.L.		
74	1	HOG FEEDER	10 24 66	75.00	.00	10	7.50	66.25	S.L.		
75	1	HOG FEEDER	10 24 66	75.00	.00	10	7.50	66.25	S.L.		
76	1	HOG FEEDER	10 24 66	75.00	.00	10	7.50	66.25	S.L.		
77	1	HOG FEEDER	10 24 66	75.00	.00	10	7.50	66.25	S.L.		
		NEW FEED MILL	1 30 67	1650.00			330.00				ADDL. 1ST YEAR DEPR.
79	1	NEW FEED MILL	1 30 67	1381.87	100.00	10	128.19	1158.68	S.L.	120	
80	1	NEW AIR COMPRESSOR	2 24 67	76.56	.00	10	7.02	69.54	S.L.	5	
82	1	NEW ELEVATOR	6 30 67	525.00	100.00	10	24.79	400.21	S.L.		
		**** TOTAL ****					3686.96				
DEPRECIABLE BUILDINGS AND REAL ESTATE											
4	1	DAIRY BARN	1 00 62	20000.00	.00	25	800.00	15200.00	S.L.		
5	1	SILO	7 00 62	2470.00	.00	33	74.85	2062.75	S.L.		
11	1	BARN ROOF	4 00 63	750.00	.00	15	50.00	512.50	S.L.		
12	1	SLAB	6 00 63	1683.00	.00	10	168.30	911.60	S.L.		
18	1	HOG HOUSE INS LABOR	4 00 65	150.00	.00	20	7.50	129.38	S.L.		
28	1	MACHINE SHEC	11 00 61	2080.00	.00	33	63.03	1691.42	S.L.		
35	1	SILO	9 00 64	3934.00	.00	20	306.50	2758.47	DDB	275	
36	1	HOG FLOOR	12 00 64	142.00	.00	10	17.87	71.50	DDB		
46	1	OLD BARN REMODEL	6 00 66	500.00	.00	10	50.00	425.00	S.L.		
47	1	CHICKEN HOUSE	6 00 66	200.00	.00	10	20.00	170.00	S.L.		
49	1	CONCRETE FLCOR	1 20 66	141.38	.00	10	14.14	113.10	S.L.		
50	1	STEEL CORN BIN	10 08 66	3253.55	.00	20	162.68	3050.20	S.L.		

```
               48-650013   JOHN Q PUBLIC                     T E N T A T I V E   D E P R E C I A T I O N   S C H E D U L E
                           ROUTE 1 BOX 13
                     100   ALFLAFADALE, WI 53210                                   T A X   Y E A R   1 9 6 7
  RUN ON 12-15-67                                                                                                          PAGE  1
ASSET OWN  ASSET DESCRIPTION    DATE     COST OR   SALVAGE  YEARS DEPRECIATICN   REMAINING DEPR   INV CR OR   COMMENTS
 NO  NO                       ACQUIRED  $ BASIS     VALUE   LIFE     THIS YEAR    BALANCE  METH   PAYBACK (*)

*** CHANGES AFFECTING LAST YEAR CAPITAL ASSET DEPRECIATION RECORD ***

    9 1 MILL                   1-00-62    100.00      .00     10          .63       25.00  S.L.   2.50*     TRADED ON 203

*** CURRENT YEAR CAPITAL PURCHASES ***

  201 1 ELEVATOR               6-30-67    525.00   100.00      5        49.56      375.44  S.L.     12.

  202 1 10 COWS                1-15-67   4000.00  2000.00      5                           S.L.             ORIGINAL
  202 1 1 COW SOLD             3-20-67    400.00   200.00      5        10.00              S.L.             SOLD P. DEPR   10.00
  202 1 9 COWS                 1-15-67   3600.00  1800.00      5       360.00     1440.00  S.L.             AFTER CHANGE

  203 1 MILL                   1-20-67    125.00    25.00     10        10.00       90.00  S.L.      9.

  204 1 TRACTOR               11-11-67   2000.00   400.00     12        22.22     1577.78  S.L.    140.

 DEPRECIATION THIS YEAR FOR ALL ASSETS ON THE FARM DEC. 31, 1966      5574.16
 DEPRECIATION FOR 1967 CAPITAL PURCHASES                               451.78
 ADDITIONAL 1ST YEAR DEPRECIATION FOR 1967 CAPITAL PURCHASES              .00
 TOTAL DEPRECIATION FOR 1967                                          6025.94

 TENTATIVE INVESTMENT CREDIT                                           140.00
```

48-650013 JOHN Q. PUBLIC
ROUTE 1 BOX 13
100 ALFALFADALE, WI 53210

INVESTMENT CREDIT REPORT
1967

COMPILED BY
AGRICULTURAL RECORDS COOPERATIVE
MADISON WISCONSIN

DEPT OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

THE INDIVIDUAL ASSETS LISTED BELOW WERE ACQUIRED THIS YEAR AND QUALIFIED FOR INVESTMENT CREDIT. RETAIN THIS COPY FOR YOUR FILES. THE INFORMATION SPECIFIED HERE WILL BE NECESSARY IN THE EVENT OF TAX AUDIT OR DISPOSITION OF ASSETS PRIOR TO THE END OF THEIR USEFUL LIFE

ASSET NUMBER	ASSET DESCRIPTION	DATE ACQUIRED	CASH PAID	YEARS LIFE	NEW OR USED	COST OR BASIS FOR INVESTMENT CREDIT	QUALIFIED INVESTMENT	7 PER CENT INVESTMENT CREDIT
79	NEW FEED MILL	1-30-67	1,650.00	10	NEW	1,711.87	1,711.87	119.83
80	NEW AIR COMPRESSOR	2-24-67	76.50	10	NEW	76.56	76.56	5.36
82	NEW ELEVATOR	6-30-67	525.00	10	NEW	525.00	525.00	36.75
87	STEEL GRAIN BIN	11-19-67	468.75	20	NEW	468.75	468.75	32.81
88	REAL ESTATE IMP	12-18-67	294.35	20	NEW	294.35	294.35	20.60

COMPUTATION OF INVESTMENT CREDIT

QUALIFIED INVESTMENT IN NEW OR USED PROPERTY - INTERNAL REVENUE SERVICE FORM 3468

TYPE OF PROPERTY	LINE	LIFE YEARS	$ COST OR BASIS	APPLICABLE PERCENTAGE	$ QUALIFIED INVESTMENT
NEW PROPERTY	(a)	4 OR 5		33⅓	
	(b)	6 OR 7		66⅔	
	(c)	8 OR MORE	3,076.53	100	3,076.53
USED PROPERTY	(d)	4 OR 5		33⅓	
	(e)	6 OR 7		66⅔	
	(f)	8 OR MORE		100	

TOTAL QUALIFIED INVESTMENT	3,076.53
TENTATIVE INVESTMENT CREDIT	215.36

APPENDIX D

SUPPLEMENTARY FORMS AND REPORTS

Inventory Form Code

Purposes	Identification Code	
Livestock Inventory	Yearly	Monthly
Dairy Cows	Form I	Form A
Other Dairy	Form I	Form B
Complete Hog Enterprise	Form I	Form C
Weaning Pig Producing	Form I	Form C
Finishing Hog Enterprise	Form II	Form D
Ewe Flock	Form I	Form E
Lamb Feeders	Form II	Form D
Gen. Sheep	Form I	Form E
Beef Breeding Herd	Form I	Form F
Beef Feeders	Form II	Form D
Chicken Laying Flock	Form I	Form G
Broilers	Form II	
Turkey Poults	Form II	
Turkey Laying Flock	Form I	Form G
Other Productive Lsk.	Form I or II	Form D

INSTRUCTIONS FOR REPORTING INVENTORY AND OTHER SUPPLEMENTAL INFORMATION

It will be necessary to report certain inventory, production, and supplemental information on forms similar to sections of the account book currently being used. The experimental systems do not accumulate this information in a form suitable for providing the farm business analysis information now available.

Yearly Reports

General Instructions:

1. Use carbon paper to make a cuplicate copy.
2. Write your Farm Number and Name on every sheet sent to the Project Center.

Beginning of Year Instructions:

1. Complete the Beginning of Year Inventory Information:
   - A. Livestock--Columns 1 to 10 of Forms I and/or II.
   - B. Crop, Seed and Feed--Columns 1 to 6 of Forms V a and V b.
   - C. Inventory of Liabilities--Begin of year column.
   - D. Inventory of Non-Farm Assets--Begin of year column.

   Note-Request more forms if you need them.
2. Mail the carbon copies to the Project Center with your January reports.

End of Year Instructions:

1. Complete the End of Year Inventory Information:
   - A. Livestock--Columns 11 to 20 of Forms I and/or II.
   - B. Crop, Seed and Feed--Columns 7 to 12 of Forms V a and V b.
   - C. Inventory of Liabilities--End of year column.
   - D. Inventory of Non=Farm Assets--End of year column.

   Note-In November, the Project Center will mail you a number of forms equal to the number originally submitted in January. Request more if needed.
2. Submit carbon copies identified by your Farm No. and Name to Project Center with your December Reports.

Crop Production for 19__ Instructions:

1. Complete Forms VI and send to Project Center with your December reports.

Monthly Livestock Reports
Special Report #2
January 24, 1969

INSTRUCTIONS FOR REPORTING INVENTORY AND OTHER SUPPLEMENTARY INFORMATION

MONTHLY REPORTS

General Instructions:

1. The Monthly Inventory Reports for the various livestock enterprises should be kept up to date monthly, but mailed to the Project Center quarterly.

2. Use carbon paper to make a duplicate copy.

3. Print your Farm Number and Name on every sheet sent to the Project Center.

4. Be sure to report weight and value information for transferred, freshened and butchered animals on these forms.

Mailing Instructions:

1. Mail the carbon copies of the Monthly Inventory Reports to the Project Center on a quarterly basis. Mail these with your March, June, September, and December transactions.

   The March report sent to the Project Center, will include monthly data for January, February, and March. The June report will include only information for April, May, and June.

   A supply of Monthly Inventories will be provided as needed.

Farm No. ____________

Name ______________________________________

__________________________ INVENTORY

FOR PURCHASED ANIMALS ONLY						BEGINNING OF YEAR INVENTORY							
1	2		3	4		5	6	7	8	9		10	
Date Purch.	Original Cost		Est. Life	Annual Deprec.		Description	No.	Age	Weight	Operator		Landlord	
BEGINNING OF YEAR TOTALS								XX					

FOR PURCHASED ANIMALS ONLY						END OF YEAR INVENTORY							
11	12		13	14		15	16	17	18	19		20	
Date Purch.	Original Cost		Est. Life	Annual Deprec.		Description	No.	Age	Weight	Operator		Landlord	
END OF YEAR TOTALS								XX					

Form I

Farm No. ________

Name ________________________________

________________ ENTERPIRSE INVENTORY

FOR PURCHASED ANIMALS ONLY					BEGINNING OF YEAR INVENTORY							
1	2	3	4		5	6	7	8	9		10	
Date Purch	Purchased Weight	Lot No.	Original Cost		Description	No.	Age	Weight	Total Farm		Landlord Share	
BEGINNING OF YEAR TOTALS							XX					

FOR PURCHASED ANIMALS ONLY					END OF YEAR INVENTORY							
11	12	13	14		15	16	17	18	19		20	
Date Purch	Purchased Weight	Lot No.	Original Cost		Description	No.	Age	Weight	Total Farm		Landlord Share	
END OF YEAR TOTALS							XX					

Form II s

Farm No. ____________

Name ____

CROP SEED AND FEED INVENTORY

Beginning of Year								
1	2	3	4		5		6	
Description	Quantity	Price	Value		Operator		Landlord	
FEED GRAIN								
CASH GRAIN								
SEED								
TOTALS								

End of Year								
7	8	9	10		11		12	
Description	Quantity	Price	Value		Operator		Landlord	
FEED GRAIN								
CASH GRAIN								
SEED								
TOTALS								

Form V a

Farm No ____________

Name ______________________________________

INVENTORY OF LIABILITIES

Description	Date Due	Begin of Year	End of Year
Real Estate -$ A			
Chattel & Crop -$B			
Notes - $ C			
Accounts - $D			
TOTAL			

INVENTORY OF NON FARM ASSETS

Description	Begin of Year	End of Year
Stocks		
Bonds		
Cash Surrender		
of Life Insurance		
Shares in Mrkt.		
Organizations		
Outside		
Real Estate		
Savings Accounts		
Cash in Bank		
Cash on Hand		
Household Goods		
Clothing & Jwlry.		
Pers.Share Auto		
Pers.Share Truck		
TOTAL		

LABOR INFORMATION

Month	Days Work by Unpaid Family Labor	Days of Hired Labor	
		Work	Boarded
JAN			
FEB			
MAR			
APR			
MAY			
JUNE			
JULY			
AUG			
SEPT			
OCT			
NOV			
DEC			
Total Days			
Total Value			

Form III.

Farm No. ________

Name ________________________________

MONTHLY DAIRY COW INVENTORY

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
NUMBER ON HAND FIRST OF THE MONTH													
PURCHASED													
HEIFER FRESH													
VALUE													
SOLD													
DIED													
BUTCHERED													
WEIGHT													
VALUE													
TRANSFER OUT													
VALUE													
NUMBER ON HAND END OF THE MONTH													

Form A

Farm No. ________

Name ______________________________

MONTHLY OTHER DAIRY INVENTORY

		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
NUMBER ON HAND FIRST OF THE MONTH														
PURCHASED														
BORN														
DIED														
SOLD														
BUTCHERED														
	WEIGHT													
	VALUE													
HEIFER FRESH														
	VALUE													
TRANSFER OUT														
	WEIGHT													
	VALUE													
NUMBER ON HAND END OF THE MONTH														

Form B

Farm No. ________

Name ______________________________

________________ ENTERPRISE INVENTORY

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
NUMBER ON HAND FIRST OF THE MONTH-HOGS													
-PIGS													
PURCHASED - HOGS													
- PIGS													
LITTERS NO BORN													
PIGS DIED													
HOGS DIED													
PIGS SOLD													
HOGS SOLD													
BUTCHERED													
WEIGHT													
VALUE													
NUMBER ON HAND END OF THE MONTH-HOGS													
-PIGS													

Form C

Farm No. ______

Name ______

MONTHLY FEEDER INVENTORY

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
NUMBER ON HAND FIRST OF THE MONTH													
PURCHASED													
TRANSFER IN													
WEIGHT													
VALUE													
NUMBER SOLD													
DIED													
BUTCHERED													
WEIGHT													
VALUE													
TRANSFER OUT													
WEIGHT													
VALUE													
NUMBER ON HAND END OF THE MONTH													

Form D

Farm No. ______

Name ________________________________

MONTHLY GENERAL SHEEP INVENTORY

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
NUMBER ON HAND FIRST OF MONTH- EWE													
OTHERS													
PURCHASED													
TRANSFER IN													
WEIGHT													
VALUE													
LAMBS BORN													
LAMBS DIED													
SOLD													
SHEEP DIED													
BUTCHERED													
WEIGHT													
VALUE													
TRANSFER OUT													
WEIGHT													
VALUE													
NUMBER ON HAND END OF MONTH - EWE													
OTHER													

Form E

Farm No. ________

Name ______________________________

MONTHLY BEEF BREEDING CATTLE INVENTORY

NUMBER ON HAND FIRST OF THE MONTH-COWS													
BULLS & OTHERS													
PURCHASED													
TRANSFER IN													
WEIGHT													
VALUE													
CALVES BORN													
DIED - CALVES													
ADULTS													
SOLD													
BUTCHERED													
WEIGHT													
VALUE													
TRANSFER OUT													
WEIGHT													
VALUE													
NUMBER ON HAND END OF THE MONTH-COWS													
BULLS & OTHERS													

Farm No. ________

Name ______________________________

LAYING HEN MONTHLY INVENTORY

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
NUMBER ON HAND FIRST OF MONTH													
PURCHASED													
PULLETS BEGIN TO LAY													
WEIGHT													
VALUE													
DIED													
SOLD													
USED IN HOME													
WEIGHT													
VALUE													
NUMBER ON HAND END OF THE MONTH													

Form G

LOG SHEET

(Condensed and Shortened)

Enterprise____________________ Description______________

Weight per head________________ Price per head___________

Lot Number____________________

Information

Purchase					Sales
Date	Head		Weight	Cost	Weight Value
		Purchase			
		Sale or loss			
		Subtotal			
		Sale or loss			
		Subtotal			

Farm No. ________

Name ______________________________

MONTHLY FEED RECORD

FORM IXa.

Month ______________________

Feed Enterprise	Corn		Oats		Barley		Wheat		Complete Rations		Protein, Salt, Min.		Whole Milk	
	Bu.	Value	Bu.	Value	Bu.	Value	Bu.	Value	Lbs.	Value	Lbs.	Value	Lbs.	Value
Beginning Inv.														
Purchases														
Raised														
Total Available														
Less Ending Inv.														
Amount Fed														
Fed To														
Fed To														
Fed To														
Fed To														
Fed To														
Fed To														

Feed Enterprise	Legume Hay		Other Hay		Corn Silage		Grass Silage		Pasture					
	Cwt.	Value	Cwt.	Value	Cwt.	Value	Cwt.	Value	Days	Value				
Beginning Inv.														
Purchases														
Raised														
Total Available														
Less Ending Inv.														
Amount Fed														
Fed To														
Fed To														
Fed To														
Fed To														
Fed To														
Fed To														

EFR-12
REV. 11-68

48-65-0013 100

JOHN Q. PUBLIC

TAX FINAL ADJUTMENT

ELECTRONIC FARM RECORDS

ADJUSTMENTS for TAX FINAL

FARM NO. 48-650013 NAME John Public

PAGE NO. 1 OF 1 PAGES. REPORT MONTH [illegible] YEAR ______

LINE NO	DATE	CODE	KIND OF ADJUSTMENT	PLUS OR MINUS	TOTAL ADJUSTMENT DOLLARS	CENTS	REMARKS
1	12-31	099-0129	**FARM INSURANCE** paid this year to be applied in future years	–			
2	12-31	099-0129	**FARM INSURANCE** for this year paid in prior years	+			
3	12-31	099-0130	**MORTGAGE INTEREST** paid to be deducted for home	–	50	00	
4	12-31	099-0109	**FARM GAS & OIL** to be deducted for personal use	–			
5	12-31	099-0119	**REAL ESTATE TAXES** to be deducted for home	–	25	00	
6	12-31	099-0129	**FARM INSURANCE** to be deducted for home	–	52	00	
7	12-31	099-0149	**FARM UTILITIES EXPENSE** to be deducted for personal use	–	150	00	
8	12-31	099-0189	**FARM AUTO EXPENSE** to be deducted for personal use	–			
9	12-31	099-0150	**CASH RENT** to be deducted for home	–			
10			**INTEREST PAID** but not reported as "Farm Interest Paid" on monthly reports – Enter on **DECEMBER EXPENSE FORM**				

LINE NO	DATE	CODE	KIND OF ADJUSTMENT	PLUS OR MINUS	TOTAL ADJUSTMENT DOLLARS	CENTS		REMARKS
11	12-31	099-0129	**FARM INSURANCE** paid this year to be applied in future years	–			100	
12	12-31	099-0129	**FARM INSURANCE** for this year paid in prior years	+			100	
13	12-31	099-0130	**MORTGAGE INTEREST** paid to be deducted for home	–			100	
14	12-31	099-0109	**FARM GAS & OIL** to be deducted for personal use	–			100	
15	12-31	099-0119	**REAL ESTATE TAXES** to be deducted for home	–			100	
16	12-31	099-0129	**FARM INSURANCE** to be deducted for home	–			100	
17	12-31	099-0149	**FARM UTILITIES EXPENSE** to be deducted for personal use	–			100	
18	12-31	099-0189	**FARM AUTO EXPENSE** to be deducted for personal use	–			100	
19	12-31	099-0150	**CASH RENT** to be deducted for home	–			100	
20			**INTEREST PAID** but not reported as "Farm Interest Paid" on monthly reports – Enter on **DECEMBER EXPENSE FORM**					

RETURN THIS COPY ALONG WITH YOUR INPUT REPORTS FOR DECEMBER TO: AGRICULTURAL RECORDS COOPERATIVE, 6225 UNIVERSITY AVE., MADISON, WIS. 53705

Farm No. ________

Name ________________________________

CROP PRODUCTION FOR 19 ___

LINE		CROP CODE	OWNED		RENTED		REMARKS
			ACRES to 1/10	PRODUCTION (TOTAL)	ACRES to 1/10	PRODUCTION (TOTAL)	
11	FLAX	66	.	BU.	.	BU.	
21	BARLEY	63	.	BU.	.	BU.	
31	WHEAT	64	.	BU.	.	BU.	
41	OATS AND OAT MIXTURE--GR.	62	.	BU.	.	BU.	
51	RYE	67	.	BU.	.	BU.	
61	CANNING PEAS	72	.	$	.	$	
71	POTATOES	71	.	CWT	.	CWT	
81	SUGAR BEETS	76	.	TON	.	TON	
91	OTHER CULTIVATED CROPS-A	77	.	$	.	$	
101	OTHER CULTIVATED CROPS-B	78	.	$	.	$	
111	SUNFLOWERS	74	.	CWT	.	CWT	
121	OAT SILAGE	65	.	TON	.	TON	
131	CANNING CORN	73	.	$	.	$	
141	CORN FOR GRAIN	61	.	BU.	.	BU.	
151	HYBRID SEED CORN	75	.	BU.	.	BU.	
161	SOYBEANS	68	.	BU.	.	BU.	
171	CORN AND CANE SILAGE	69	.	TON	.	TON	
181	CORN AND CANE FODDER	60	.	TON	.	TON	
191	ALFALFA HAY	81	.	TON	.	TON	
201	OTHER LEGUME HAY AND MIXT.	82	.	TON	.	TON	
211	TAME GRASS HAY	83	.	TON	.	TON	
221	ANNUAL HAY	84	.	TON	.	TON	
231	LEGUME AND GRASS SILAGE	89	.	TON	.	TON	
241	LEGUME SEED	70	.	LBS	.	LBS	
251	GRASS SEED	80	.	LBS	.	LBS	
261	ALFALFA AND MIXED PASTURE	86	.	---	.	---	
271	OTHER LEGUME PASTURE	87	.	---	.	---	
281	OTHER TILLABLE PASTURE	88	.	---	.	---	
291	DIVERTED ACRES	79	.	$	.	$	
301	SUMMER FALLOW--TILLED	95	.	---	.	---	
311	OTHER TILLABLE LAND IDLE	96	.	---	.	---	
321	WILD HAY	85	.	TON	.	TON	
331	NON TILLABLE PASTURE		.		.		
341	TIMBER	99	.	$	.	$	
351	ROADS AND WASTE		.		.		
361	FARMSTEAD		.		.		

Form VI.

F.A.51 (Revised 1/69)

Record Year 19__

SUPPLEMENTARY INFORMATION FORM

Operator's Name____________________ Age____ Address________________________

Wife's Name________________________ School________________________

I. PLEASE INDICATE LAND CHARGE TO BE USED FOR CROP SUMMARIES $____PER ACRE

II. MEMBERS OF FAMILY LIVING AT HOME DURING THE YEAR (Include operator and wife)

Members of family	No. of persons		Adult Equiv. per person		Adult Equivalent
Child under 7 years	____________	X	.4	=	________
Child 7-12 years	____________	X	.6	=	________
Girls 13-18 years	____________	X	.8	=	________
Boys 13-18 years	____________	X	.9	=	________
Women	____________	X	.8	=	________
Men	____________	X	1.0	=	________
TOTAL:	____________	X	TOTAL:		________

III. FARM LABOR INFORMATION

Days of hired labor, day labor ______________Days

Months of hired labor on monthly basis ______________Months

Hired labor boarded by operator (___) X $1.75 per day = $__________

Hired labor boarded by partner(s) (___) X $1.75 per day = $__________

Unpaid family labor, days____ X $8.00 per day = $__________

months____ X $200.00 per month = $__________

No. of operators or partners ____________________

No. of months each operator worked ____________________ Months

-or-

No. of days partner(s) worked (figure 25 days per month) ____________________Days

No. of months others boarded, not including hired help ____________________ Months

IV. STATUS OF THE OPERATOR

In what year did you start farming?__________.

Owner______________; Partnership (own land in partnership)___________;

Renter_____________; Partowner (owner, renting additional land)______.

Describe lease or partnership agreement______________________________

____

MISSING DATA REQUEST

(format)

TAX OR ANALYSIS INFORMATION WAS NOT COMPLETE FOR THE TRANSACTIONS LISTED BELOW. PLEASE CHECK YOUR FILE COPIES OF INPUT. REPORT THE REQUESTED INFORMATION AND RETURN THIS FORM TO A.R.C. WITH YOUR NEXT MONTHLY INPUT FORMS.

01-050028 MR. ED
FLD. 308
DEC 69 STABLE, MINN. 56466

REPORT MONTH	PG NO	LN NO	TRANS DATE	ENT CD	ITEM CODE	ITEM DESCRIPTION	ENTERPRISE	OPERATOR AMOUNT	LANDLORD AMOUNT	ASSET NO.
May	01	02	5-20-69	011	3710	Milk Sold	Dairy Herd	496.26	.00	

THE FOLLOWING ITEMS ARE NEEDED TO COMPLETE THE ABOVE TRANSACTION.

PER CENT FAT - - - - - - - - - - - - - - - - - (.)

***

F.A. 11
(953-4).

CROP AND FEED CHECK

Name:____________________**County:**____________**Date: From**__________ **to** ____

Crop or Feed:	Corn		Oats							
Unit used	T. Bu. Lbs.	Value	T. Bu. Lbs.	Value	T. Bu. Lbs.	Value	T. Bu. Lbs.	Value	T. Bu. Lbs.	Value
PURCHASES										
Total Bot.										
Beg. Inv.										
Raised										
Total Supply										
SALES Include crops sold by landlord. Mark with "L."										
Total Sales										
Seeded										
End. Inv.										
Total										
Available for Feed										
FED	Rept.	Adjust.	Rept.	Adjust.	Rept.	Adjust.	Rept.	Adjust.	Rept.	Adjust.
Dairy or Dual Purpose Cows										
Other Dairy or Dual Purpose										
Beef Breeding Herd										
Feeder Cattle										
Hogs										
Sheep Farm Flock										
Feeder Sheep or Turkeys										
Chickens										
Horses										
Total Fed.										

Use separate sheet for owned and rented land.
This sheet is for:
Owned______________ Rented______________.

CROP DATA

1 Kind of Crop	2 Acres	3 Yield Per Acre	TOTAL PRODUCTION				SEED USED		10 Remarks (Disposal of Landlord's Share of Crops, etc.)
			4 Whole Crop	5 Oper. Share	6 Lld. Share	7 Total	8 Oper. Share	9 Lld. Share	
Total Tillable Land									
Wild Hay (non-tillable)									
Pasture (non-tillable)									
Timber									
Waste and Road									
Farmstead									
Total Land									

JOHN Q. PUBLIC
ROUTE 1 BOX 13
ALFALFADALE, MINN.   53210

ENTERPRISE UNIT REQUEST
FOR ENTERPRISE SUMMARY
(CONDENSED)

NOTE TO PARTICIPANTS

THIS REQUEST FORM IS A LISTING OF THE ENTERPRISES YOU HAVE USED IN REPORTING YOUR FINANCIAL TRANSACTIONS THIS YEAR.

PLEASE REPORT THE NUMBER OF UNITS FOR EACH ENTERPRISE IN THE COLUMN BELOW, AND RETURN THIS SHEET TO AGRICULTURAL RECORDS COOPERATIVE BY 01-20-70.

ENTERPRISE REPORTED	NO. OF UNITS
11 DAIRY HERD	
12 DY YNG STK	
21 HOG FARROW	
22 HOG FATTEN	
61 FIELD CORN	
62 OATS	
89 HAY CROPS	
99 GEN FARM	

PROJECT CENTER VO-AG RECORDS
AGRICULTURAL EDUCATION DEPT.
312 NORTH HALL
UNIVERSITY OF MINNESOTA
ST. PAUL, MINNESOTA 55101

February 3, 1970

Dear Cooperator:

We would remind you that charged items appear as cash expenses on Tax Final. In filing your tax, you will need to adjust the totals to reflect the amount of charges not paid in 1969. Charges paid in 1969 for 1968 accounts may need to be added. Contact your ag man if you have questions.

If you find errors on your December printout which affect your Tax Final, you must adjust your Tax Final. Also, submit a correction request to the Project Center so that your records are corrected for analysis purposes.

You were requested to report the $ Amount of personal share of electricity and telephone on the Adjustment for Tax Final. However, the method used to adjust the tax information complicated the analysis procedure to the point where we elected to not report this adjustment. As a result, you will need to subtract these amounts from your farm expenses as reported on the Tax Final.

Subtract: Electricity $____________.

Telephone $____________.

We did not receive your Tax Final Adjustment. Please adjust your tax report and submit this information to the Project Center to allow corrections for your analysis reports.

Sincerely,

Gary Leske

CODING QUESTIONS
(Condensed)

Name____________________

Farm No.____________________

Month____________________

Form	Page & Line or Check Numbers	Date	Enterprise	Item Description	Quantity	$ Amount	Other

DECEMBER REPORTS

Regular Forms -

______ Corrections

______ Receipts

______ Capital Asset Transactions (Monthly)

______ Expenses

Transferred to Regular Forms -

______ Monthly Feed Record

______ Produce Used - Oct., Nov., Dec. and other amounts not previously reported (to Receipt Form)

1. Check and total for the year.
2. Record yearly totals on December Produce Used Form. Quantities should be totaled here.

______ Correct Non-Cash Expenses of feeder livestock sold. Review Feeder Log Sheets.

______ Monthly Livestock Inventories

1. Transfer animals - values non-cash
   a. Check for earlier reports (should have been reported quarterly).
2. Butchered values - Non-Cash income only.
   a. Check for earlier reports

______ Missing Weight Request (receipts only)

1. Combine with weights of livestock sold form information.

______ Purchased Feed Volume Adjustment

1. Enter volume as 1 cent purchase of feed type involved - charged to proper enterprise.

Other form -

______ Tentative Depreciation Schedule

______ Missing Data Request

1. Be sure weights were not duplicated on Missing Weight Requests.

______ Adjustments for Tax Final

1. Be sure $ Amounts are entered.
2. If percentages are reported, calculate $ Amounts. November printout totals plus December reports plus any December corrections times per cent indicated.

______ Enterprise Unit Request

1. Check units for crops with Crop Production Form.
2. Cross off Enterprise 91 units.

APPENDIX E

Page

Printout

Monthly Detailed Transaction Report 294

Monthly Enterprise Report 298

Tax Final Report. 299

AR 48-650013 JOHN Q. PUBLIC
REPORT DATE JUNE 67 100
ROUTE 1 BOX 13
ALFALFADALE, WI 53210

MONTHLY DETAILED TRANSACTION REPORT

COMPILED BY
AGRICULTURAL RECORDS COOPERATIVE

DEPT. OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

PAGE NO.	LINE NO.	TRANSACTION DATE MO. – DAY – YEAR	ENTER-PRISE CODE	ITEM CODE	TAX CATEGORY ITEM	ENTERPRISE	% FAT OR NO HEAD	QUANTITY	UNIT OF MEASURE	OPERATOR AMOUNT THIS MO. $	OPERATOR YEAR TO DATE $	LANDLORD AMOUNT THIS MO. $	LANDLORD YEAR TO DATE $
1	1	6-15-67	99	10	WORKER 01	GEN FARM				191.60			
1	2	6-15-67	99	10	WORKER 02	GEN FARM				22.00			
					TOTAL LABOR EXPENSE					213.60	1555.00		
1	18	6-15-67	11	29	OTHER FEED BOUGHT	DAIRY HERD				302.00			
2	2	6-20-67	12	29	OTHER FEED BOUGHT	DY YNG STK				82.95			
2	3	6-20-67	22	29	OTHER FEED BOUGHT	HOG FINISH				644.31			
2	4	6-20-67	21	29	OTHER FEED BOUGHT	HOG FARROW				136.46			
					TOTAL FEED EXPENSE					1165.72	4592.76		
1	9	6-30-67	61	30	SEED & PLANTS BOUGHT	FIELD CORN				439.20			
					TOTAL SEED & PLANTS					439.20	815.28		
1	17	6-15-67	11	52	DAIRY SUPPLIES	DAIRY HERD				34.95			
1	4	6-30-67	99	59	OTHER SUPPLIES	GEN FARM				29.64			
					TOTAL SUPPLY EXPENSE					64.59	417.54		
1	14	6-30-67	99	69	OTHER REPAIRS MAINT	GEN FARM				196.95			
					TOTAL REPAIR & MAINT					196.95	981.98		
1	10	6-09-67	11	70	BREEDING FEES	DAIRY HERD				135.00			
					TOTAL BREEDING FEES					135.00	165.00		
					TOTAL VET & MEDICINE						180.72		
1	13	6-06-67	99	109	OTHER FARM FUEL	GEN FARM				136.00			
					TOTAL FARM GAS & OIL					136.00	710.00		
					TOTAL FARM TAXES						1381.00		
					TOTAL FARM INSURANCE						400.40		
1	3	6-20-67	99	130	FARM INTEREST PAID	GEN FARM				659.23			
					TOTAL FARM INTEREST					659.23	1475.50		
2	1	6-15-67	99	141	ELECTRICITY	GEN FARM				64.45			
1	5	6-15-67	99	142	TELEPHONE	GEN FARM				18.08			
					TOTAL UTILITIES					82.53	680.77		
					TOTAL CASH RENT						476.20		
1	15	6-15-67	11	161	MILK HAULING	DAIRY HERD				181.87			
					TOTAL HAULING EXP					181.87	1036.64		
					TOTAL AUTO EXPENSE						128.00		
					TOTAL MISC CROP EXP						24.90		

AR 48-650013 JOHN Q. PUBLIC

JUNE 67

MONTHLY DETAILED TRANSACTION REPORT

COMPILED BY
AGRICULTURAL RECORDS COOPERATIVE

DEPT. OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

```
                                                                                                   LANDLORD
                                                                       AMOUNT THIS MO $  YEAR TO DATE $  AMOUNT THIS MO $  YEAR TO DATE $

1 14  6-15-67  11  202 MILK TESTING DHIA     DAIRY HERD                22.46
1 16  6-15-67  11  209 OTHER LIVESTOCK EXP   DAIRY HERD                75.06
                       TOTAL GEN LVSTCK EXP                            97.52       485.40

                       TOTAL GEN FARM EXP                                          180.30

                       TOTAL OPERATING EXP   * * * * * * * * * * * * * 3372.21   15407.31

2  5  6-02-67  99 1300 POWER MOWER           GEN FARM                 169.87                ASSIGNED ASSET NO. 201
1  7  6-08-67  99 1300 FEED MILL ATTACHMENT  GEN FARM                 176.00                ASSIGNED ASSET NO. 202
                       TOTAL MACHY PURCHASE                           345.87      3354.25

                       TOTAL CAP PURCHASES   * * * * * * * * * * * * * 345.87      3354.25

1  8  6-30-67 193 2410 MEDICAL AND DENTAL    PERSONAL                 132.90
                       TOTAL MED & DENTAL                             132.90       279.73

                       TOTAL CONTRIBUTIONS                                          17.00

                       TOTAL PERSONAL TAXES                                        313.73

2  8  6-30-67 193 2461 FOOD BOUGHT           PERSONAL                 207.10
2  9  6-30-67 193 2462 CLOTHING BOUGHT       PERSONAL                  65.54
2  7  6-30-67 193 2469 MISC PERSONAL EXPENS  PERSONAL                  30.75
                       TOTAL OTHER PERS EXP                           303.39      1453.05

                       TOTAL PERSONAL EXP.   * * * * * * * * * * * * * 436.29      2063.51
```

AR 48-650013 JOHN Q. PUBLIC

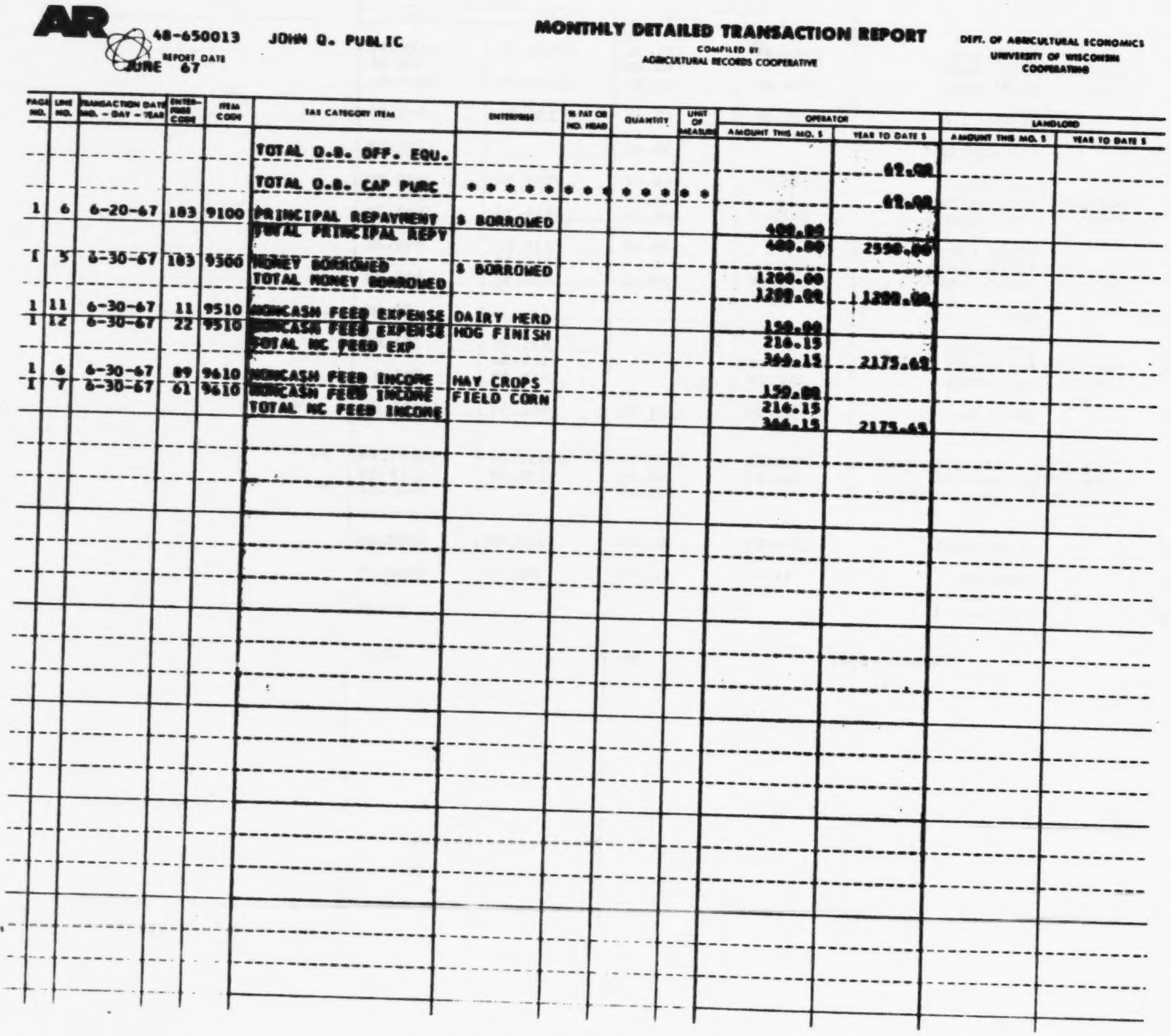
REPORT DATE
JUNE 67

MONTHLY DETAILED TRANSACTION REPORT

COMPILED BY
AGRICULTURAL RECORDS COOPERATIVE

DEPT. OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

PAGE NO.	LINE NO.	TRANSACTION DATE MO. - DAY - YEAR	ENTERPRISE CODE	ITEM CODE	TAX CATEGORY ITEM	ENTERPRISE	% FAT OR NO HEAD	QUANTITY	UNIT OF MEASURE	OPERATOR		LANDLORD	
										AMOUNT THIS MO. $	YEAR TO DATE $	AMOUNT THIS MO. $	YEAR TO DATE $
1	12	6-01-67	12	3510	DAIRY CATTLE SOLD	DY YNG STK	1	75	LBS	15.00			
					TOTAL DY CATTLE SOLD					15.00	72.90		
1	14	6-06-67	22	3550	SWINE SOLD	HOG FINISH		405	LBS	106.27			
1	15	6-06-67	22	3550	SWINE SOLD	HOG FINISH	1	180	LBS	40.00			
1	13	6-20-67	22	3550	SWINE SOLD	HOG FINISH		405	LBS	102.42			
					TOTAL SWINE SOLD					248.69	6864.32		
					TOTAL GRAIN SOLD						303.60		
					TOTAL HAY SOLD						525.00		
1	1	6-15-67	11	3710	MILK SOLD	DAIRY HERD	4.30	57,737	LBS	2011.79			
					TOTAL MILK SOLD					2011.79	15833.93		
1	4	6-01-67	99	3810	MACHINE WORK INCOME	GEN FARM				34.00			
1	3	6-16-67	99	3810	MACHINE WORK INCOME	GEN FARM				15.50			
					TOTAL MACH WORK INC					49.50	257.30		
					TOTAL PATRON DIV INC						15.17		
					TOTAL GAS TAX REFUND						43.50		
					TOT ORDNRY FARM INC	* * * * *	* * *	* * * *	* *	3124.98	23915.72		
1	11	6-02-67	11	4821	R COW SOLD	DAIRY HERD	1	880	LBS	137.10			
					TOTAL CAPITAL GAIN					137.10	1696.67		
1	4	6-15-67	193	4906	INSURANCE PAYMENT	PERSONAL				14.60			
					TOTAL NONFARM INCOME					14.60	348.67		



AR 48-650013 JOHN Q. PUBLIC
REPORT DATE JUNE 67

MONTHLY DETAILED TRANSACTION REPORT
COMPILED BY
AGRICULTURAL RECORDS COOPERATIVE

DEPT. OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

PAGE NO.	LINE NO.	TRANSACTION DATE MO. – DAY – YEAR	ENTER-PRISE CODE	ITEM CODE	TAX CATEGORY ITEM	ENTERPRISE	% FAT OR NO. HEAD	QUANTITY	UNIT OF MEASURE	OPERATOR AMOUNT THIS MO. $	OPERATOR YEAR TO DATE $	LANDLORD AMOUNT THIS MO. $	LANDLORD YEAR TO DATE $
					TOTAL O.B. OFF. EQU.						62.00		
					TOTAL O.B. CAP PURC	* * * * *	* *	* * * *	* *		62.00		
1	6	6-20-67	103	9100	PRINCIPAL REPAYMENT	$ BORROWED				400.00			
					TOTAL PRINCIPAL REPY					400.00	2590.00		
1	5	6-30-67	103	9300	MONEY BORROWED	$ BORROWED				1200.00			
					TOTAL MONEY BORROWED					1200.00	1200.00		
1	11	6-30-67	11	9510	NONCASH FEED EXPENSE	DAIRY HERD				150.00			
1	12	6-30-67	22	9510	NONCASH FEED EXPENSE	HOG FINISH				216.15			
					TOTAL NC FEED EXP					366.15	2175.65		
1	6	6-30-67	89	9610	NONCASH FEED INCOME	HAY CROPS				150.00			
1	7	6-30-67	61	9610	NONCASH FEED INCOME	FIELD CORN				216.15			
					TOTAL NC FEED INCOME					366.15	2175.65		

48-650013 JOHN Q. PUBLIC
REPORT DATE ROUTE 1 BOX 13
JUNE 67 100 ALFALFADALE, WI 53210

MONTHLY ENTERPRISE SUMMARY REPORT

COMPILED BY
AGRICULTURAL RECORDS COOPERATIVE

DEPT. OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

ENTERPRISE CODE	ENTERPRISE	THIS MONTH $		YEAR TO DATE $		REMARKS
		RECEIPTS	EXPENSES	RECEIPTS	EXPENSES	
11	DAIRY HERD	2948.89	751.34	17419.54	4119.31	
11	NON CASH DAIRY HERD		150.00		920.30	
	TOTAL DAIRY HERD	2948.89	901.34	17419.54	5039.61	
12	DY YNG STK	15.00	82.95	183.96	342.05	
21	HOG FARROW		136.46		1050.49	
22	HOG FINISH	248.69	644.31	6864.32	1685.94	
22	NON CASH HOG FINISH		216.15		1255.35	
	TOTAL HOG FINISH	248.69	860.46	6864.32	2941.29	
61	FIELD CORN		439.20	178.60	448.20	
61	NON CASH FIELD CORN	216.15		1255.35		
	TOTAL FIELD CORN	216.15	439.20	1433.95	448.20	
62	OATS				30.90	
89	HAY CROPS			525.00	361.00	
89	NON CASH HAY CROPS	150.00		920.30		
	TOTAL HAY CROPS	150.00		1445.30	361.0	
99	GEN FARM	49.50	1317.95	440.97	10659.80	
	FARM TOTAL CASH OPERATING	3262.08	3372.21	25612.39	18697.69	**
	FARM TOTAL NON-CASH	366.15	366.15	2175.65	2175.65	
	FARM TOTAL CAPITAL PURCH.		645.87		1520.87	*
183	$ BORROWED	1200.00	400.00	1200.00	2550.00	
193	PERSONAL	14.00	436.29	348.67	2063.51	
204	OTH BUS. A				69.00	
	TRANSACTIONS		34		215	

AR 48-650013 JOHN Q. PUBLIC
REPORT DATE ROUTE 1 BOX 13
YEAR 1967 100 ALFALFADALE, WI 53210

MONTHLY DETAILED TRANSACTION REPORT

COMPILED BY
AGRICULTURAL RECORDS COOPERATIVE

TAX FINAL REPORT PAGE 1

DEPT. OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

PAGE NO.	LINE NO.	TRANSACTION DATE MO. - DAY - YEAR	ENTER-PRISE CODE	ITEM CODE	TAX CATEGORY ITEM	ENTERPRISE	% FAT OR NO HEAD	QUANTITY	UNIT OF MEASURE	OPERATOR		LANDLORD	
										AMOUNT THIS MO. $	YEAR TO DATE $	AMOUNT THIS MO. $	YEAR TO DATE $
					** TOTALS ADJUSTED TO REFLECT FARM SHARE ONLY								
			FARM OPERATING EXPENSES										
					LABOR HIRED						2730.18		
					REPAIRS MAINTENANCE						1640.64		
					INTEREST **		ADJUSTED BY			-50.00	2884.69		
					FEED EXPENSE						16431.36		
					SEED PLANT PURCHASED						577.60		
					FERTILIZERS LIME						2586.45		
					MACHINE HIRE						225.00		
					SUPPLIES PURCHASED						1492.36		
					BREEDING FEES						304.01		
					VETERINARY, MEDICINE						894.63		
					GASOLINE FUEL OIL **						1819.89		
					TAXES **		ADJUSTED BY			-25.00	1337.12		
					INSURANCE **		ADJUSTED BY			-52.00	292.90		
					UTILITIES **		ADJUSTED BY			-150.00	1051.25		
					FREIGHT TRUCKING						1829.36		
					AUTO EXPENSE **						177.04		
					CROP EXPENSE						65.30		
					LIVESTOCK EXPENSE						1245.81		
					OTHER FARM EXPENSE						359.21		
					DHIA LIVESTOCK REG						266.08		
					FEES DUES SERVICE						121.50		
					FARM EXPENSE TOTAL		***************				38332.38		
		FARM RECEIPTS											
					DAIRY CALVES SOLD						515.60		
					SWINE SOLD ORD INC						15205.09		
					GRAIN SOLD						160.75		
					HAY SOLD						348.00		
					MILK SOLD						26755.74		
					WOOL SOLD						34.50		
					MACHINE WORK INCOME						1101.75		
					PATRON DIV - REBATES						110.35		
					GAS TAX REFUND						225.00		
					OTHER FARM INCOME						383.50		
					FARM RECEIPTS TOTAL		***************				44840.28		

AR 48-650013 JOHN Q. PUBLIC

REPORT DATE
YEAR 1967

MONTHLY DETAILED TRANSACTION REPORT

COMPILED BY
AGRICULTURAL RECORDS COOPERATIVE

DEPT. OF AGRICULTURAL ECONOMICS
UNIVERSITY OF WISCONSIN
COOPERATING

TAX FINAL REPORT PAGE 2

PAGE NO.	LINE NO.	TRANSACTION DATE MO. - DAY - YEAR	ENTERPRISE CODE	ITEM CODE	TAX CATEGORY ITEM	ENTERPRISE	% FAT OR NO HEAD	QUANTITY	UNIT OF MEASURE	OPERATOR AMOUNT THIS MO. $	OPERATOR YEAR TO DATE $	LANDLORD AMOUNT THIS MO. $	LANDLORD YEAR TO DATE $
		INCOME FROM ITEMS PURCHASED FOR RESALE											
		07-01-67	21	4804	P BOAR SOLD		1				60.00		
		02-28-67	22	4804	P PIGS SOLD		38				1402.02		
		03-25-67	22	4804	P HOGS SOLD		45				1395.90		
					***** TOTAL *****						2857.92		
		INCOME TO BE REPORTED ON SCHEDULE D -- INCLUDING LIVESTOCK HELD LESS THAN 12 MONTHS -- SEE NOTE											
		01-19-67	11	4821	P COW SOLD		7				933.22		
		03-15-67	11	4821	P COWS 40 11 64 SLD						395.20		
		04-22-67	11	4821	P COWS 23 33 SOLD		2				247.60		
		06-01-67	11	4821	R BULL SOLD		1				150.00		
		06-22-67	11	4821	P COWS 3-8-56 SOLD		3				547.75		
		10-18-67	11	4821	R COW SOLD		1				129.95		
		12-01-67	11	4821	P COWS SOLD		4				466.00		
					***** TOTAL *****						2869.72		
		01-26-67	21	4824	R SOW SOLD		1				37.70		
		04-05-67	21	4824	P BOAR SOLD		1				70.00		
		05-10-67	21	4824	R SOWS SOLD		5				264.67		
		07-01-67	21	4824	R SOWS SOLD		8				503.25		
					***** TOTAL *****						875.62		
		NOTE-- SEE THE CAPITAL ASSET RECORD AS OF JANUARY 1 FOR COSTS OF PURCHASED ITEMS											
					PERSONAL DEDUCTIBLE EXPENSES AND RECEIPTS								
			PERSONAL		DEDUCTIBLE EXP								
					MEDICAL DENTAL						531.32		
					CONTRIBUTIONS						34.00		
					NON-FARM INTEREST **		ADJUSTED BY			+50.00	50.00		
					PERSONAL TAXES **		ADJUSTED BY			+25.00	232.00		
					MISC DEDUCTIBLE EXP						41.95		
					PERS DEDUCT EXP TOTL		***************				814.27		
			PERSONAL		RECEIPTS								
					NON-FARM WAGES						631.58		
					PERS NON-TAX INCOME						422.36		
					PERS RECEIPTS TOTAL		***************				1053.94		
					OTHER BUSINESS EXPENSES AND RECEIPTS BY ENTERPRISE								
			OTHR BUS. A EXPENSES										
		05-15-67	204	8000	FILE CABINET PUR						37.07		
					TOTAL OTHR BUS A EXP		***************				37.07		

APPENDIX F

RETRIEVAL INFORMATION FOR FARM RECORDS PROJECT

Keys: INV. - Inventory
F.R. - Feed Record
M.I. - Monthly Inventory
P.U. - Produce Used

FORM I

Line	Column	Retrieval Code
11	B,C	INV.
11	E,F	INV.
11	H	M.I.
11	J	M.I.
12	A,B,C	M.I.
12	E,F	011 - 3510,3731,4801,4811,4821,4843,4844,4849
12	H,I	011 - 1331
21	B,C	INV.
21	E,F	INV.
21	H	M.I.
21	J	M.I.
22	A,B,C	M.I.
22	E,F	012,014,015,016,017 - 3510,3731,4801,4811,4821, 4843,4844,4849
22	H,I	012,014,015,016,017 - 1331
31	A,B,C	INV.
31	D,E,F	INV.
31	G,H	M.I.
31	I,J	M.I.
32	A,B,C	M.I.
32	D*,E,F	041,042 - 3520,3732,4802,4812*,4822*,4843,4844,4849 (Compensating entry under 3520 in December)

*No Weights if reported in center section.

Line	Column	Retrieval Code
32	G	No Weights recorded - 1332, Feeder weights from Log Sheet.
32	H.I	041,042 - 1332 + Values from Log Sheet
41	A,B,C	INV.
41	D,E,F	INV.
41	G,H	M.I.
41	I,J	M.I.
42	A,B,C	M.I.
42	D,E,F	043,044,045,046,047 - 3520,3732,4802,4843
42	G,H,I	(043,044,045,046,047 - Cannot be retrieved EFR) Retrieve from Log Sheet.
51	A,B,C.	INV.
51	D,E,F	INV.
51	G,H	M.I.
51	I,J	M.I.
52	A,B,C	M.I.
52	D*,E,F	021 - 3550,3734,4804,4814*,4824*,4843,4844,4849 (Must make a compensating entry under 3550 to adjust weights in December).
52	G	No weights recorded - 1334, Feeder weights from Log Sheet.
52	H,I	021 - 1334, Feeder values from Log Sheet.
61	A,B,C	INV.
61	D,E,F	INV.
61	G,H	M.I.
61	I,J	M.I.
62	A,B,C	M.I.
62	D*,E,F	022,024,025,026,027 - 3550,3734,4804,4814*,4824*, 4843,4844,4849
62	G	(022,024,025,026,027 - Cannot be retrieved EFR). Feeder Log Sheet, no weights recorded-1334.

*No Weights if reported in the center section.

Line	Column	Retrieval Code
62	H,I	(022,024,025,026,027 - 1334) Feeder values from Log Sheets.
71	A,B,C	INV.
71	D,E,F	INV.
71	G,H	M.I.
71	I,J	M.I.
72	A,B,C	M.I.
72	D*,E,F	023 - 3550,3734,4804,4814*,4824,4843,4844,4849
72	G	No weights - 1334, Feeder Log Sheet
72	H,I	023 - 1334, Feeder values from Log Sheet
81	A,B,C	INV.
81	D,E.F	INV.
81	G,H	M.I.
81	I,J	M.I.
82	A,B,C	M.I.
82	D*,E,F.	031,039 - 3540,3733,4803,4813*,4823*,4843,4844,4849
82	G	No weights recorded - 1333, Feeder Log Sheet
82	H,I	031,039 - 1333, Feeder values from Log Sheet
91	A,B,C	INV.
91	D,E,F	INV.
91	G,H	M.I.
91	I,J	M.I.
92	A,B,C	M.I.
92	D*,E,F	032 - 3540,3733,4803,4813*,4823*,4843,4844,4849
92	G	No weights - 1333, Feeder Log Sheet
92	H,I	032 - 1333, Feeder values from Log Sheet
101	B,C.	INV.
101	E,F	INV.

* No weights if reported in center section.

Line	Column	Retrieval Code
101	G,H	M.I.
102	A,B,C	M.I.
102	E,F	051,055,056,057 - 3560,4805,4815,4825,4843
102	H,I	051,055,056,057 - 0206
111	A,B,C	INV.
111	D,E,F	INV.
111	I,J	M.I.
112	A,B,C	M.I.
112	D,E,F	052 - 3560,4805,4843
112	G,H,I	052 - 0206
121	A,B,C	INV.
121	D,E,F	INV.
121	G,H	M.I.
122	A,B,C	M.I.
122	D**,E,F	054 - 3560,4805,4815*,4825*,4843
122	G,H,I	054 - 0206
131	A,B,C	INV.
131	D,E,F	INV.
131	I,J	M.I.
132	A,B,C	M.I.
132	D**,E,F	053 - 3560,4805,4843**
132	G,H,I	053 - 0206
141	A,B,C	INV.
141	D,E,F	INV.
142	A,B,C	M.I.

*No Weights if reported in center section.
**Weights recorded in #'s - reported in 10# units - Form 1.

Line	Column	Retrieval Code
142	D,E,F	058,094 - 3530,3560,3570,3730,3750,4806,4816,4826, 4843,4844,4849
142	G,H.I	058,094 - 0206,1339
151	B,C	INV.
151	E,F	INV.

Line	Column	Source	Code	Owner Group
161	B	Beg. Cap. Asset Record	X	2
161	C	Beg. " " "	X	5
161	E	End. " " "	X	2
161	F	End. " " "	X	5
171	B	Beg. " " "	1	1
171	C	Beg. " " "	1	4
171	E	End. " " "	1	1
171	F	End. " " "	1	4
181	A	Beg. " " "	X	3
181	C	Beg. " " "	X	6
181	E	End. " " "	X	3
181	F	End. " " "	X	6
191	B	Beg. " " "	0	1
191	C	Beg. " " "	0	4
191	E	End. " " "	0	1
191	F	End. " " "	0	4
201	B	Beg. " " "	2	1
201	C	Beg. " " "	2	4
201	E	End. " " "	2	1
201	F	End. " " "	2	4

211 A,C,E,F, From Other Inventory Not in EFR

Line	Column	Source	Code	Owner Group
221	A,C,E,F	From Owner Group 9 -		Code for operator and landlord does not differentiate - Must be retrieved by hand. - Input by hand on Computer data sheet.

Line	Column	Retrieval Code
231	B,C	INV.
231	E,F	INV.
241	B,C	INV.
241	E,F	INV.
251	B,C	INV.
251	E,F	INV.
261	B,C	INV.
261	E,F	INV.
271	A,B,C	P.U.
281	A,B,C	P.U.
291	A,B,C	P.U.
301	A,B,C	xxx - 3712
311	A,B,C	xxx - 3710,3711
321	A	xxx - 3710 - Calculated
331	A	Not Available - Input by hand on computer data sheets
341	A,B,C	031,039 - 3740

Line	Column	Retrieval Code
351	B,C	031,039 - 3850
332	A	Not Available - Input by hand on computer data sheets
342	A,B,C	032 - 3740
352	B,C	032 - 3850
361	A,B,C	051 - 3720
371	A,B,C	054 - 3720
381	A,B,C	P.U.
391	B,C	P.U.
401	A,B,C,D,E,F,G,H,I,J	M.I.
411	A,B,C,D,E,F,G,H,I,J	M.I.
421	A,B,C,D,E,F,G,H,I,J	M.I.
431	A,B,C,D,E,F,G,H,I,J	M.I.
441	A,B,C,D,E,F,G,H,I,J	M.I.
451	A,B,C,D,E,F,G,H,I,J	M.I.
461	A,B,C,D,E,F,G,H,I,J	M.I.
471	A,B,C,D,E,F,G,H,I,J	M.I.
481	A,B,C,D,E,F,G,H,I,J	M.I.
491	A,B,C,D,E,F,G,H,I,J	M.I.
501	A,B,C,D,E,F,G,H,I,J	M.I.
511	A,B,C,D,E,F,G,H,I,J	M.I.
521	A,B,C,D,E,F,G,H,I,J	M.I.
531	A,B,C,D,E,F,G,H,I,J	M.I

Line	Column	Retrieval Code
402	A	Not Available, Not Used
402	B	M.I.
402	D	011 - 0051,0052,0055,0059,0070,0105,0201,0202,0203 0205,0207,0209,0212,0214,0218
402	E	011 - 0090
402	F	011 - 0041,0161,0162
402	G,H,I	Not Available, Not Used
412	A	Not Available, Not Used
412	B,C	M.I.
412	D	012,014,015,016,017 - 0051,0052,0055,0059,0105,0201, 0203,0205,0209,0212,0214,0218
412	E	012,014,015,016,017 - 0090
412	F	012,014,015,016,017 - 0041,0162
412	G,H,I	Not Available, Not Used
422	A	Not Available, Not Used
422	B,C	M.I.
422	D	041,042 - 0051,0055,0059,0070,0105,0201,0203,0205, 0209,0212,0214,0218
422	E	041,042 - 0090
422	F	041,042 - 0041,0162
422	G,H,I	Not Available, Not Used
432	A	Not Available, Not Used
432	B,C	M.I.
432	D	043,044,045,046,047 - 0051,0055,0059,0201,0205, 0209,0212,0214,0218
432	E	043,044,045,046,047 - 0090
432	F	043,044,045,046,047 - 0041,0162
432	G,H,I	Not Available, Not Used

Line	Column	Retrieval Code
442	A	M.I.
442	B,C	M.I.
442	D	021 - 0051,0055,0059,0070,0105,0201,0203,0205,0209, 0212,0214,0218
442	E	021 - 0090
442	F	021 - 0041,0162
442	G,H,I	Not Available, Not Used
452	A	Not Available, Not Used
452	B,C	M.I.
452	D	022,024,025,026,027 - 0051,0055,0059,0105,0201,0203, 0205,0209,0212,0214,0218
452	E	022,024,025,026,027 - 0090
452	F	022,024,025,026,027 - 0041,0162
452	G,H.I.	Not Available, Not Used
462	A	M.I.
462	B,C	M.I.
462	D	023 - 0051,0055,0059,0070,0105,0201,0203,0205,0209, 0212,0214,0218
462	E	023 - 0090
462	F	023 - 0041,0162
462	G,H,I	Not Available, Not Used
472	A	Not Available
472	B,C	M.I.
472	D	031,039 - 0051,0055,0059,0070,0105,0201,0203,0205, 0209,0212,0214,0218
472	E	031 - 0090
472	F	031 - 0041,0162
472	G,H,I	Not Available, Not Used

Line	Column	Retrieval Code
482	A	Not Available, Not Used
482	B,C	M.I.
482	D	032 - 0051,0055,0059,0105,0201,0205,0209,0212, 0214,0218
482	E	032 - 0090
482	F	032 - 0041,0162
482	G,H,I	Not Available, Not Used
492	A	Not Available, Not Used
492	B,C	M.I.
492	D	051,055,056,057 - 0051,0053,0104,0105,0201,0205, 0209,0212,0214,0218
492	E	051,055,056,057 - 0090
492	F	051,055,056,057 - 0041,0162
492	G,H,I	Not Available, Not Used
502	A	Not Available, Not Used
502	B,C	M.I.
502	D	052 - 0051,0053,0104,0105,0201,0205,0209,0212, 0214,0218
502	E	052 - 0090
502	F	052 - 0041,0162
502	G,H,I	Not Available, Not Used
512	A	Not Available, Not Used
512	B,C	M.I.
512	D	054 - 0051,0053,0070,0104,0105,0201,0205,0209, 0212,0214,0218
512	E	054 - 0090
512	F	054 - 0041,0162
512	G,H,I	Not Available, Not Used

Line	Column	Retrieval Code
522	A	Not Available, Not Used
522	B,C	M.I.
522	D	053 - 0051,0053,0104,0105,0201,0205,0209,0212,0214, 0218
522	E	053 - 0090
522	F	053 - 0041,0162
522	G,H,I	Not Available, Not Used
532	A,B,C,D, E,F,G,H,I	Not Used

RETRIEVAL INFORMATION FOR FARM RECORDS PROJECT

Keys: INV. - Inventory
F.R - Feed Record
M.I. - Monthly Inventory
P.U. - Produce Used
F.A.51 - Family Information Sheet

FORM 2

Line	Column	Retrieval Code
11	A.B	xxx - 0090
21	A,B	011 - 058,091,094,099 - 0051,0052,0053,0059,0070, 0104,0105,0121,0201,0202,0203,0205,0207,0209,0212, 0214,0218,011 - 058,094,099 - 0055
31	A,B	xxx - 0021,0022,0023,0024,0025,0029
41	A,B	xxx - 0081,0082
51	A,B	xxx - 0196,0197,0198
61	A,B	xxx - 0030,0054,0123,0199,060-089 - 0109
71	- -	- - - - - - -
81	A,B	(xxx - 0042,0161,0162,0169) X .60
91	A,B	(xxx - 0040) X .70
101	A,B	(xxx - 0041) X .50
111	A,B	[(xxx - 0042,0161,0162,0169)X .40] + (xxx - 0040 X .30) + (xxx - 0041 X .50)
121	A,B	xxx - 0069
131	A,B	099,-0058,0063,0064,193-2472,099-0171,0172,0173,0179
131	C	193 - 2472
141	A	xxx - 1310 Owner Group 2 + 5 + 9*
141	B	xxx - 1310 Owner Group 5
141	C	xxx - 1310 Owner Group 9*

*Cluttered with other items. - Items in Owner Group 9 must be input by hand.

Line	Column	Retrieval Code	
151	A	xxx-1310-1 + xxx-1310-4	
151	B	xxx-1310-4	
161	A	xxx-1310-3 + xxx-1310-6	
161	B	xxx-1310-6	
171	A	xxx-1320-1 + xxx-1320-4	
171	B	xxx-1320-4	
181	A	099-1330-1 + 099-1300-4	
181	B	099-1300-4	
191	A	xxx-1300-9* Landlords & Operators	
191	B	xxx-1300-9* Landlord's Share, Landlord's House	
191	C	xxx-1300-9* Operator's Share, Operator's House	
201	A,B,C	099-4829,4819,4841	Codes not discrete - must be collected by hand. Information can be obtained from Tax Final.
211	A,B	099-4827,4817,4841	
221	A,B	099-4827,4817,4841	
231	A,B	099-4828,4818,4842	
241	A,B	099-4828,4818	
251	A,B,C	099-4828,4818	
261	A,B	099-3860,3861	
271	A,B	099-0101,0102,0106,0107,0109,0181,0185	
271	C	099-0109 - Tax Final Adjustment	
281	A,B	099-0101,0106,0109	
291	A,B	099,0102,0107	
291	C	099-0109 - Tax Final Adjustment	
301	A,B	099-0181,0185	
301	C	Included in 291 C	

* Input by hand - information gathered from Monthly capital asset purchases.

Line	Column	Retrieval Code
311	A,B	060-089,095-097,099-0051,0061;099-0062,0103,0125,0182,0183,0184,0189
311	C	099-0189 - Tax Final Adjustment
321	A,B	060-089,095-097,099-0051,0061;099-0103
331	A,B	099,-0062,0125
331	C	099-0189 - Tax Final Adjustment + 193-2464
341	A,B	099-0182,0183,0184,0189,093-2464
341	C	Included in 331 C
351	A,B	xxx - 0010,0018,0019
361	A,B	xxx - 0111,0112,0119
361	C	099-0119 - Tax Final Adjustment
371	A,B	xxx-0150
381	A,B	099-0121,0122,0124,0129,0149,0169,0211,0212,0213,0214,0215,0216,0218,0219
381	C	099-0129 - Tax Final Adjustment
391	A,B	099-0142
391	C	Input at Project Center.
401	A,B	099-0141
401	C	Input at Project Center.
411		099-3810,193-4902
421	A,B	(xxx - 3810) X .05
431	A,B	(xxx - 3810) X .60
441	A,B	(xxx - 3810) X .05
451	A,B	(xxx - 3810) X .30 + 193-4902
461	A,B	099-3840*
471	A,B	099-3610,3611,3820,3850,3870,4809,3872
481	A	(xxx-9300 - Form 1, Line 231,241,251,261,col.B)

*Cluttered, may contain refund items and discounts not normally reported in this category for the analysis report.

Line	Column	Retrieval Code
491	A	xxx-9100,9110 (Tax Final Adjustment Interest Paid as part of 9110)
501	A	xxx-0130,0186
511	A	193-2470
521	A	193-4903,4904,4905,4906,4907
531	A	193-4901,4909
451	A	193-2440
551	A	193-4908
561	A	193-2420
571	A	193-2410,2411
581	A	193-2461
591	A	193-2430,2450,2463,2469
601	A	193-2471
611	A	193-2462
621	A	193-2465
631	A	193-2466
641	A	193-2467
651	A	193-2468
661	A	F.A.51
671	A	F.A.51 - Form 2 Data Sheet
681	A	F.A.51
691	A	F.A.51
701	A	099-0011 - Operator
711	A	099-0011 - Landlord
721	A	F.A.51
731	A	F.A.51
741	A	F.A.51
751	A	F.A.51

Line	Column	Retrieval Code
761	A	F.A.51
771	A	F.A.51
781	A	Project - Enrollment Form
791	A	Keyed from Inventory

RETRIEVAL INFORMATION FOR FARM RECORDS PROJECT

FORM 3

Line	Column	Retrieval Code
11	A,B,C,D,E	Crop Data
11	F,G	066-3610,3611,3871,3622
21	A,B,C,D,E	Crop Data
21	F,G	063-3610,3611,3622,3871
31	A,B,C,D,E	Crop Data
31	F,G	064-3610,3611,3622,3850,3871
41	A,B,C,D,E	Crop Data
41	F,G	062-3610,3611,3622,3871
51	A,B,C,D,E	Crop Data
51	F,G	067-3610,3611,3622,3871
61	A,B,C,D,E	Crop Data
61	F,G	072-3640,3871
71	A,B,C,D,E	Crop Data
71	F,G	071-3640,3871
81	A,B,C,D,E	Crop Data
81	F,G	076-3640,3850,3871
91	A,B,C,D,E	Crop Data
91	F,G	077-3611,3640,3650,3850,3871
101	A,B,C,D,E	Crop Data
101	F,G	078-3611,3640,3650,3850,3871
111	A,B,C,D,E	Crop Data
111	F,G	074-3611,3650,3871
121	A,B,C,D,E	Crop Data
121	F,G	065-3621,3871

Line	Column	Retrieval Code
131	A,B,C,D,E	Crop Data
131	F,G	073-3621,3640,3871
141	A,B,C,D,E	Crop Data
141	F,G	061-3610,3611,3622,3871
151	A,B,C,D,E	Crop Data
151	F,G	075-3610,3611,3622,3871
161	A,B,C,D,E	Crop Data
161	F,G	068-3610,3611,3622,3871
171	A,B,C,D,E	Crop Data
171	F,G	069-3621,3871
181	A,B,C,D,E	Crop Data
181	F,G	060-3621,3871
191	A,B,C,D,E	Crop Data
191	F,G	081-3620,3871
201	A,B,C,D,E	Crop Data
201	F,G	082-3620,3871
211	A,B,C,D,E	Crop Data
211	F,G	083-3620,3871
221	A,B,C,D,E	Crop Data
221	F,G	084-3620,3871
231	A,B,C,D,E	Crop Data
231	F,G	089-3621,3871
241	A,B,C,D,E	Crop Data
241	F,G	070-3611,3871
251	A,B,C,D,E	Crop Data
251	F,G	080-3611,3871
261	A,B,C,D,E	Crop Data
261	F,G	086-3620

Line	Column	Retrieval Code
271	A,B,C,D,E	Crop Data
271	F,G	087-3620
281	A,B,C,D,E	Crop Data
281	F,G	088-3620
291	A,B,C,D,E	Crop Data
291	F,G	079-3620,3850
301	A,B,C,D,E	Crop Data
301	F,G	095-3850
311	A,B,C,D,E	Crop Data
311	F,G	096-3850
321	A,B,C,D,E	Crop Data
321	F,G	085-3620,3622
331*		
341	A,B,C,D,E	Crop Data
341	F,G	097-3760,3830
351*		
361*		
**		
12	A	066-0081,0082
12	B	066-0196,0197,0198
12	C	066-0030,0054,0123,0199
12	D	066-0010,0011,0018,0019
12	E	066-0040,0042,0169
12	F	Calculated
12	G	F.A.51
12	H	Calculated from depreciation schedule for irrigation equipment.

ERIC Clearinghouse
MAR 0 3 1971
on Adult Education

*No Enterprise Number is Assigned.

**The Retrieval Codes for lines 12 through 312, Columns A,B,C,D,E,F,G,H, are identical except for the enterprise number which is specific for each line.